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MANAGEMENT AND OPERATION OF THE U.S. DEPARTMENT OF ENERGY'S FERNALD, OH, FEED MATERIALS PRODUCTION CENTER

HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY, NUCLEAR
PROLIFERATION, AND GOVERNMENT PROCESSES

OF THE

COMMITTEE ON
GOVERNMENTAL AFFAIRS
UNITED STATES SENATE

NINETY-NINTH CONGRESS

FIRST SESSION

APRIL 22, 1985
CINCINNATI, OH

Printed for the use of the Committee on Governmental Affairs

U.S. GOVERNMENT PRINTING OFFICE
50-399 O WASHINGTON : 1985

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MANAGEMENT AND OPERATION OF THE U.S. DEPARTMENT OF ENERGY'S FERNALD, OH, FEED MATERIALS PRODUCTION CENTER

MONDAY, APRIL 22, 1985

U.S. SENATE,
SUBCOMMITTEE ON ENERGY,
NUCLEAR PROLIFERATION, AND GOVERNMENT PROCESSES,
COMMITTEE ON GOVERNMENTAL AFFAIRS,
Cincinnati, OH.

The subcommittee met at 9:40 a.m., in the council chambers, Cincinnati City Hall, 801 Plum Street, Hon. Thad Cochran, chairman of the subcommittee, presiding.

Present: Senators Cochran, Glenn, and Congressman Luken.

OPENING STATEMENT OF SENATOR COCHRAN

Senator COCHRAN. The committee will please come to order.

I want to welcome everyone to the hearing of the Subcommittee on Energy, Nuclear Proliferation, and Government Processes of the U.S. Senate.

This hearing has been authorized by the chairman of the full Committee on Governmental Affairs, Senator Bill Roth of Delaware.

It's a pleasure for me to be here to chair this hearing.

We're looking into the management and operation of the U.S. Department of Energy's Fernald, OH, Feed Materials Production Center.

This hearing was requested by Senator Glenn, who is the ranking minority member of the subcommittee. Senator Glenn has been active in issue areas that include nuclear nonproliferation and radioactive safety, and he has served as chairman of this subcommittee.

Our subcommittee is interested in assuring, through oversight activities, that the laws enacted by the Congress in the area of nuclear energy and safety are carried out by the executive branch and its regulatory agencies.

The Department of Energy announced last December its concerns about excessive levels of uranium that were being released into the air through the stacks during operations of plants 5 and 9 at the Fernald facility. Those plants were shut down, and an investigation into the causes and possible effects of these emissions was ordered.

The Incident Investigation Board completed its report on February 6, 1985. We want to know what is being done to carry out the recommendations of the Board. We will hear testimony today from officials of the Department of Energy on the facts surrounding uranium releases at those plants and on the corrective actions that have been taken at the facility to safeguard the workers, the public, and the environment from any contamination or harm from the release of uranium particles into the air or water of this community.

Also testifying will be representatives of the Fernald Residents for Environmental Safety and Health, the Ohio Department of Health, the Ohio Environmental Protection Agency, the U.S. Environmental Protection Agency, the National Institute of Occupational Safety and Health, and the local trade and labor unions.

In addition, we've invited the Honorable Anthony Celebrezze, Jr., the attorney general of the State of Ohio, to testify at this hearing.

I want to express our appreciation for the attendance and cooperation of all the witnesses. I hope we can obtain a clear and accurate picture of the problems at this nuclear energy facility, what needs to be done to correct them, what is being done or what will be done to correct them.

I don't expect this job to be easy, but it is one that deserves our very best efforts.

Senator Glenn.

OPENING STATEMENT OF SENATOR GLENN

Senator GLENN. Thank you very much, Mr. Chairman.

As the senior Senator from the State of Ohio, I want to begin by welcoming Senator Cochran to Cincinnati, and all of you who have come out this morning for this official hearing of the Senate Subcommittee on Energy, Nuclear Proliferation, and Government Processes. The subcommittee is part of the Governmental Affairs Committee that oversees the various functions of Government, organizational functions of Government, and what those organizations are supposed to be doing.

In an official capacity, I'm also glad this morning in his home district here, to have Congressman Tom Luken with us because he's been interested in this problem and difficulties for a long time, as he would be in his area. It's not unusual for an official Senate committee to ask a Congressman from that particular district to participate. And, so, Tom, we're very glad to have you join us here this morning.

The subject of today's hearing is the management of health and safety at nuclear facilities run by the U.S. Department of Energy. And let me emphasize that while our hearing will focus today on the Feed Materials Production Center at Fernald, the problems we will be addressing go far, far beyond just any one plant or facility.

Indeed, problems similar to those at Fernald have been reported at DOE facilities all across the country, including Savannah River in South Carolina; Hanford in Washington; Rocky Flats in Colorado; and at Oak Ridge in Tennessee.

So, hopefully, the testimony and evidence we receive at this and future hearings on Fernald will lead to solutions that can be applied to other facilities as well.

So let there be no mistake about the purpose of today's hearing. It is not merely to dredge up the unpleasant facts of the past or to berate those who manage the plant for the lapses of the present, nor are we here to demand a shutdown of Fernald facility. In fact, the plant plays a unique and a most important role in maintaining the national security of our country. I would submit that plants such as Fernald go somewhat unheralded in our whole system in the defense structure of this Nation of ours, because they do the routine processing job, starting out with what winds up eventually on down the line as nuclear weapons, the plutonium separation and so on is a key part of that process. They keep our country safe. They are part of the process that provides that kind of a deterrent.

For 30 years, Fernald has met all of its production schedules and has, thus, played a vital role in keeping America's nuclear defenses strong.

The Fernald facility also plays an important economic role in this community, and the 1,060 jobs it provides has helped to feed many a family.

My goal today is a simple one. It is to identify those steps that must be taken to improve the safety and health protection of Fernald workers, the environment, and the residents of surrounding communities.

Let me also say this. Although most of us have become aware of the problems at Fernald only recently, the situation has existed for three long decades. And although we may not be able to do anything about the past releases of radiation from the plant, I strongly believe that the public has a right to know about such releases. Workers and residents alike have a right to know what happened and when it happened. They have a right to know what risks they've been exposed to in the past, and they have the right to know what's being done to reduce the hazards in the future.

In short, I believe people have the right to know the truth, and I believe their Government has the responsibility to tell them.

In some ways, the truth is not very pleasant. Specifically, I believe that the management of the plant by National Lead of Ohio, NLO, under the policies of, first, the old Atomic Energy Commission, then ERDA, Energy Research Development Agency, and now by DOE, Department of Energy, have been clearly insensitive to growing public and worker concern about health, safety, and environmental protection.

Now, that's not just a John Glenn opinion. If it was, I would be suspicious of it, too, because I don't consider myself a full-time expert in this area.

Let me add that DOE's own task force report on the Review of Operations at the Fernald plant, released in June of last year, June 1984, revealed that the NLO management has unacceptable attitudes toward health, safety, and environmental protection. The report also documented a number of deficiencies in maintenance, operator training and supervision, and it indicated a lack of receptivity to new, safer production technologies. These deficiencies, when coupled with the data available on past releases of radioactive materals, make it clear that the releases, which took place in 1984, were nothing less than an accident waiting to happen.

Let me add again, these are not just my opinions. Those are opinions out of the DOE Task Force Report.

Yet despite these shortcomings, DOE still saw fit to rate NLO "excellent" or "superior" in overall performance, and the rating then was accompanied by a bonus award of well over $1 million.

Lately, DOE and NLO have been claiming that the radioactive releases that took place last year did not present a significant health risk to workers or nearby residents.

Let me add here that a difference of opinion exists between EPA and DOE as to exactly what those standards should be. EPA calculations suggest that the releases from the plant exceeded the present EPA standard for radiation dose rates at the boundary or fence-line around DOE facilities. The standard for safe exposure is 75 millirems per year to the lung—the equivalent of three to four chest x rays.

Now, while that standard has been exceeded each year since 1980, these emissions really look tame compared to what went on at FMPC back in the 1950's and 1960's. In order to roughly compare exposures than and now, I asked the EPA Office of Radiation Programs, which had done a careful study in the Fernald community in 1981, to do a net set of calculations for all the years of operation of FMPC, going clear back through all the records. These calculations made one assumption. They assumed identical meteorological conditions and other variables to those known in 1981, so they might be questionable only in that small regard. And we went back and used the uranium emission rates on record.

I am releasing the results of these calculations today. They show that between 1956 and 1969, for instance, a person living at the northeast boundary of the FMPC would have experienced an average annual radiation of the lung equivalent to about 140 chest x rays.

In the worst year, 1956, the dose rate at that boundary was equivalent to about 460 chest x rays. Now, that last figure is nearly double the present occupational radiation limit.

Let me say this: EPA sets one standard for just general population, and another standard for those who knowlingly put themselves at risk in a nuclear environment, such as working in a plant. In a plant, the occupational radiation limit has been about 5 rems per year, and the general population radiation at 75 millirems per year.

For the general population, these kinds of dosages that I just mentioned a moment ago would exceed the EPA standard by over 12,000-percent, or about 125 times the government-set limit of exposure. The corresponding figures for exposure on the site were, of course, much worse. That's the occupational hazard that's accepted by those who work there. All of these figures will be refined further by EPA after they obtain correct data from DOE on the specific meteorological conditions for the years in question.

I think these are rather startling figures. And in light of them, I believe that the Centers for Disease Control [CDC] should undertake an epidemiological study of the communities in the Fernald area in order to assess the consequences of these incredibly high rates of exposure during the 1950's and 1960's. The CDC made a similar study at Three Mile Island, and they have already agreed to my informal request to examine the exposure data at Fernald and determine the feasibility of undertaking such a study.

The most important thing is we have to correct the situation, not just restate it again. In 1985, perhaps our ability to monitor, and our ability to do a proper assessment is better than it was back in those days of the 1950's and 1960's, and so we want to get on with it.

In the meantime, we must see to it that what happened in the past is never repeated. Accordingly, I intend to focus my efforts at this hearing on improvements that can be made at Fernald and other sites. As I indicated at the beginning of my remarks, I'm fully aware of the economic and national security benefits the plant provides, but,as I said when I toured FMPC last month, that while plants like Fernald are essential to the security of our country, we must see to it that the cost of that security does not include the health of our people.

In that spirit, I will question our witneses today on what needs to be done, and on whether they support the initiatives I have already undertaken to deal with some of these problems. Specifically, I will refer to Senate bill S. 525—the Radiation Research Reorganization Act of 1985—which I introduced in the Senate and Congressman Tim Wirth of Colorado introduced in the House, and also Senate bill S. 892—the Mixed Hazardous Waste Amendment Act of 1985—which I introduced with my friend and colleague. Congressman Tom Luken, Cincinnati, who is with us here today.

Let me reiterate, we are not here today to scare people. We are not here today to shut down the plant. We don't want to do any excessive finger-pointing and blame-assigning. We're here to learn the facts, to learn what's wrong, to learn how we can correct it. Past practices have created a serious mess, and now is the time to start cleaning it up.

Thank you, Mr. Chairman.

Senator COCHRAN. Thank you, Senator.

We're glad to have joining our hearing today, Congressman Luken, who represents the area of this facility we're examining today.

Congressman, I recognize you for any comments or statements that you would like to make at this time. Welcome.

OPENING STATEMENT OF CONGRESSMAN LUKEN, U.S. REPRESENTATIVE FROM THE STATE OF OHIO

Congressman LUKEN. Thank you, Senator Cochran.

In my experience in these hallowed halls, which has been more than a little, I believe this is the first time that we've been honored to have a senatorial gathering, a senatorial hearing, and we're honored by that, but we're especially appreciative, Senator Cochran and Senator Glenn, that you are willing to come here today because we are so very concerned about the issues, about the safety of our citizens, and about the continuation of this particular facility, this plant, which produces materials which are so vital to our Nation's defense.

Unfortunately, the people of this area have lived with Fernald for about 30 years under a delusion of safety and protection.

In recent months, the whole fabric of deceit—and that's what we'll have to call it—which was woven by the governmental agencies, especially DOE, has been shredded, and the film has now been lifted from our eyes, and the people now look back at 30 years of environmental neglect.

The recent admission by DOE that it had lied to the neighborhood well owners when it divulged that the existence of uranium in their wells, and at the same time specifically concealed the fact from them that it was processed, enriched uranium is significant.

The fact that this vital information was deliberately withheld from well owners certainly violates their right to know under any standard and does epitomize the sad 30 year record of neglect.

The report by the Department of Energy's own Incident Investigation Board concluded that the plant utilized control equipment that, "borders on the obsolescent," and that the operator of the facility was somewhat casual—somewhat casual—with respect to inspection and monitoring of the bag-house leakage, which has been referred to.

The Department has admitted to a loss of more than 95,000 kilograms over the course of the plant's operation.

In response to our pleas for DOE to clean up Fernald, we have been told that there's a new attitude by DOE management, a real commitment to cleanup the plant and operate in a safe manner.

That is the subject we're going to take up principally today. The sins of the past are over, but we must look at them, we must examine them for information, for guidance, in what we should do to correct them.

How much faith can we put in these good words, however, when DOE gives the operator, just recently, an excellent rating with full knowledge of all the misgivings that it had and we have now about that operation?

We will be hoping to pin down, as Senator Cochran and Senator Glenn have said, DOE to its commitments to the people who live in the shadow of FMPC; that the plant will be run correctly and safely.

I believe the only way we will be able to assure that this facility will be operated correctly is to deeply involve the State and Federal agencies in this constant review and regulation of Department of Energy activities.

I'm pleased in a response to our committee in the House, the Oversight and Investigations Subcommittee, the Attorney General suit, EPA has actively started to review the environmental conditions of the plant. I'm also hopeful that we will be able to provide more EPA direct regulation at Fernald as a result of the legislation that Senator Glenn has referred to.

In addition, it will be necessary for our House and Senate Committees to keep a close watch on all activities here.

The mission of Fernald is vital to the Nation's security. It's the only plant of its kind operating in the United States. It's worth the investment in dollars, time and effort to upgrade it in a safe and productive manner.

I hope we can leave here today with a commitment to do that from the Department of Energy, and then follow up with that same department.

Thank you again, Senator.

Senator COCHRAN. Thank you, Congressman.

Our first panel of witnesses will include representatives of the Department of Energy and National Lead of Ohio, the contractor that operates the facility.

Representing the Department of Energy is Mr. Ronald W. Cochran, who is Deputy Assistant Secretary for Nuclear Materials, the Office of Defense Programs of the Department, and Mr. Joe La Grone, who's manager of the Oak Ridge Operations Office.

National Lead of Ohio is represented by Mr. Robert M. Spenceley, who is the Fernald plant manager, and Mr. Mike Boback, consultant and former senior environmental health and safety officer.

We have statements that have been prepared by the witnesses, and all of these statements will be made a part of the record in full. We would encourage the witnesses to limit the oral presentation to the committee to 10 minutes or less, if you please, so we can hear from all the witnesses and have an opportunity for a full discussion of the issues.

Mr. Cochran.

TESTIMONY OF RONALD W. COCHRAN, DEPUTY ASSISTANT SECRETARY FOR NUCLEAR MATERIALS, OFFICE OF DEFENSE PROGRAMS, U.S. DEPARTMENT OF ENERGY; JOE LA GRONE, MANAGER, OAK RIDGE OPERATIONS, U.S. DEPARTMENT OF ENERGY; AND ROBERT M. SPENCELEY, MANAGER, NLO, INC.

Mr. COCHRAN. Thank you, Mr. Chairman, Senator Glenn, Congressman Luken.

I'm very pleased to have the opportunity to appear before you today to discuss the management of health and safety at Department of Energy facilities, concentrating on the Feed Materials Production Center at Fernald, OH, as an example.

In your opening statements you asked about the Department's commitment to operate the plant safely and to correct the accumulated problems of the past. I am here this morning to tell you that Secretary Herrington is personally dedicated to protecting the health and safety of our workers and the public. He is committed to further improvement in our practices and is committed to taking all reasonable actions to correct problems which are found to exist at DOE facilities. You may be assured of his support in working to correct any deficiencies involved in health and safety policies or practices in this department.

The emission of uranium dust from the Feed Materials Production Center late in 1984 and emission of much larger amounts to both air and nearby streams during the more than 30 years of plant operations has focused both congressional and public attention on the adequacy of the Department's management policies and practices in this vital area of health and safety.

This area is a matter of sincere concern to the Department. At the time of the releases last autumn, the Department already had reviews underway to identify actions which would be needed to upgrade our equipment and activities at the Feed Materials Production Center to reduce emissions and radiation exposures to "as low as reasonably achievable," as is required by our departmental orders. These overall studies have been expanded and intensified since that time.

Protecting health and safety has been one of our highest priority objectives since the inception of Nuclear Programs more than 40 years ago. This emphasis has produced an overall health and safety record for our employees which is unequalled in any other comparable industry. The Department's injury and illness rates for fiscal year 1984, for example, were well below the national average.

Although we feel that this overall record is outstanding, it is not enough. New problems develop, other problems are discovered, and some problems build or accumulate until they assume major significance. We are dedicated to doing better in those areas where problems have been found to exist.

In addition to supporting the investigation activities which will be summarized for you during this hearing, the Secretary sent his own team of senior Department of Energy officials to the Feed Materials Production Center to review the situation concerning the problems and the issues which have been identified, as well as the overall status of completed or planned corrective actions.

The Feed Materials Production Center is important to this Nation. It is a unique national asset unmatched in its full range of capabilities and capacity by any other facility in this country. It produces uranium fuel and other uranium reactor core materials to support operation of this Nation's production reactors.

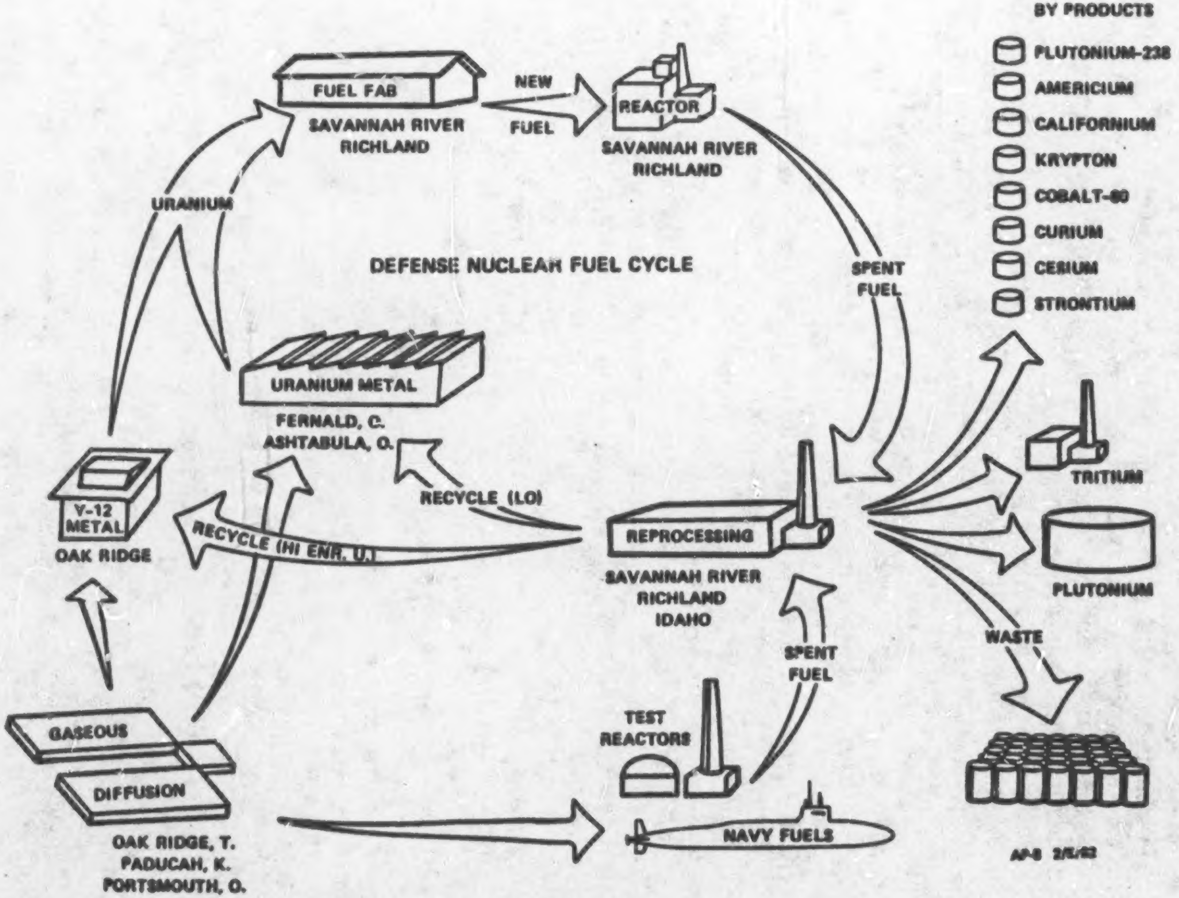
These reactors produce nuclear materials for defense, nondefense research and development, and private sector applications. Nuclear materials from these reactors are essential to the modernization of our nuclear weapons and to the maintenance of our nuclear deterrent capability to ensure peace. Materials from these reactors also provide radioactive sources for vital medical therapy, power sources for many of our major satellite space missions, smoke detectors for our homes, and radiation sources for the preservation of food.

On a more local level, the Feed Materials Production Center provides employment for well over 1,000 people from this area. It provides a payroll in excess of $40 million a year into the economy of this area.

Nevertheless, we will not operate this plant unless it is safe and the necessary repairs have been made.

We've talked a bit about where the Feed Materials Production Center fits into the overall program. Perhaps it would be best to describe that with a chart.

[The chart referred to follows:]


DEFENSE NUCLEAR FUEL CYCLE
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CALIFORNIUM
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Chart 1

Mr. COCHRAN. I apologize for this chart being difficult to see, but let me explain it.

The principal purpose of the Nuclear Materials Program is to produce plutonium and tritium for weapons. In the process of doing that, we also produce a number of byproducts which have the applications that I described to you.

The way this happens is to start with uranium. Basically, I want to describe four different materials: Plutonium, which I have already talked about, and three different types of uranium.

Uranium is made up of a number of isotopes. The most fissionable—easier to sustain a nuclear reaction—isotope is U-235. The nonfissionable isotope is U-238.

At Fernald we handle two types of uranium; depleted, which has two-tenths of 1 percent of the fissionable isotope, and low-enriched, which has up to about 2 percent of the fissionable isotope.

Highly enriched uranium, which is used for weapons and for fueling some reactors, contains greater than 90-percent of the fissionable isotope, U-235.

These materials come from the gaseous diffusion plants and for Fernald we use depleted and low-enriched uranium. At Fernald, that material is made into metal, which is shaped so that it can be shipped to our reactor sites for further fabrication into reactor fuel. One of our reactors actually uses the low-enriched material as fuel and plutonium is created in that fuel. In another type reactor, the type at Savannah River, we use a highly enriched driver fuel and U-238 targets to make plutonium. Plutonium is made from the U-238 by exposing it to neutrons.

After the fuel is irradiated in reactors, it is processed in chemical processing plants to separate out the useful products and the unburned uranium that is still a very valuable commodity for recycle back into a reactor. That is the nuclear materials fuel cycle.

In addition, in this particular program, we are responsible for providing fuel to the nuclear Navy, for reclaiming that fuel because there's still much valuable uranium in it, and for using that material as the highly enriched material to operate our production reactors.

With regard to the Fernald site, it comprises about 1,000 acres. The plant itself occupies about a fifth of that. The two shut-down plants that we are talking about are plant 5 and plant 9. These plants are where the metal is produced and cast. As I indicated earlier, we are not going to operate those plants until we are sure they are safe, all necessary fixes have been made, and we have all the necesssary approvals to operate.

I might indicate at this point, Mr. Chairman, that we think those corrections have been made. We are going to recheck that. If everything checks out, we would propose to restart the plant on May 1. However, we will not operate that plant unless it is safe and the corrective measures are in place.

The program that I described involves facilities with a replacement value of $16 billion. Over 26,000 Federal and private sector employees are involved.

For the current fiscal year, Congress has appropriated approximately $2.5 billion to operate the nuclear materials production complex. Approximately 11 percent of that, or over $260 million, is for activities aimed at protecting the health and safety of the public and our workers, and providing acceptable protection to the environment. In carrying out these activities, we will not compromise on health or safety, or adequate protection of the environment.

I would now like to address the issues concerning the Department of Energy's overall health and safety policies and performance as identified by the committee in Senator Glenn's letter.

In addition, I will discuss some of the actions the Department is taking at our sites, especially our nuclear materials and weapons production sites, to protect health and safety of our employees and the public, as well as the environment

Mr. Joe La Grone, Manager of the Department's Oak Ridge Operations Office, who has direct Federal responsibility for managing the Feed Materials Production Center, will then address those issues of interest to the committee associated with this particular site.

As I stated previously, the Department's overall health and safety record has been outstanding. Its overall environmental record has been good. However, keeping pace with the increasingly complex and dynamic situation regarding environmental regulations continues to be a challenge to us. In general, this Department must meet the same or more stringent requirements as those applied to the private sector. This has required the Department to reevaluate previously accepted practices and place a much higher priority on environmental issues. There are problems in this area which need prompt attention. We intend to work with State and local officials, other Federal agencies, and the Congress to correct problems and prevent their recurrence.

I will now try to respond to the specific issues identified by the committee.

One of the issues concerned a description of the Department's policy on radiation monitoring and informing DOE workers and the public adjacent to DOE sites concerning exposure to radiation and other hazards associated with such facilities.

Our requirements are implemented through a series of directives called DOE Orders. DOE Order 5480.1A requires that radiation monitoring be performed to assure that exposure of workers and members of the public is maintained within DOE radiation standards and is as low as reasonably achievable. For workers, this monitoring includes workplace and personal monitoring. For the public, the monitoring includes emissions and environmental monitoring of such things as air, water, and milk, that kind of thing.

DOE Order 5484.1 requires that employees be informed within 24 hours of any radiation overexposure and furnished a summary of their overexposure within 30 days of submitting a request.

DOE Order 5484.1 also requires that each nuclear installation prepare an annual environmental report. In this report, the radioactive emissions, environmental monitoring data, and calculated doses to members of the public are summarized. The reports must include discussions of any accidents, including unplanned releases of pollutants, and a summary of compliance with Federal and State laws, regulations, and permits. These reports have been widely distributed to State and local officials, other Federal agencies, and interested organizations and individuals. Clearly, there are other people who would like access to these reports, and they are available. We need to do a better job of getting those out to the public.

The above requirements on radiation monitoring and access to monitoring data were also requirements of the Atomic Energy Commission, and the Energy Research and Development Administration, the predecessor agencies of the Department of Energy.

Another issue you raised concerned a comparison of radiation risks to the public from DOE nuclear facilities and from past nuclear weapons tests. Radiation risk is related to radiation dose, which is measured in units of millirem or rem. One rem equals 1,000 millirems.

The radiation doses from natural sources remain rather constant from year to year, and those radiation doses range from about 80 to 170 millirems per person depending on the location in the United States. For comparative purposes, the information on population doses from worldwide fallout produced by nuclear weapons tests is summarized from a U.N. Scientific Commission report. The report concludes that the worldwide average annual full body dose from fallout of radionuclides is less than 2 millirems. So, natural background is 80 to 170 millirems and for worldwide fallout, add 2 millirems to that.

With regard to DOE facilities, we have calculated the dose to the cumulative population, everyone living within 80 kilometers from all 12 of our nuclear facilities. That total amount comes to less than 300 person rem in 1983. Those same individuals received greater than 2 million person rem from natural background.

In other words, DOE facilities contribute an average of less than 0.015-percent increase in radiation exposure of these people. That is a very, very small increase.

The current DOE standards for public exposure are 500 millirems per year to the whole body and 1,500 millirems per year to major organs. These standards are based on Federal Radiation Council recommendations and were implemented by Presidential directive in 1960. They are currently undergoing revision. The point here is that these are not DOE numbers. These are from an independent panel.

Another issue that was identified concerned the access of the National Institute for Occupational Safety and Health [NIOSH] to DOE facilities and worker health records. DOE's policy is best set forth in a March 28 letter to Senator Glenn which I have attached to my testimony. As indicated in that letter, DOE has completed the necessary rulemaking to provide NIOSH access to records at the Feed Materials Production Center, and we are continuing to provide access to facilities at Portsmouth.

Although the Department had proposed, during the rulemaking process, to provide access to all of our facilities, comments were received, principally from physicians, opposing such a blanket release of medical records. For this reason, the Department concluded that the proposed use of such data should be handled on a case-by-case basis.

However, I want to assure you that we will continue to work closely with NIOSH to assure that they receive the data that they need to carry out their responsibilities.

In the letter of invitation, you requested DOE's position on legislation to transfer the management of epidemiological research to the Department of Health and Human Services. The Department of Energy strongly opposes that legislation because we feel that it would not improve the quality, objectivity, or reliability of this research, and would increase the duplication of efforts in both departments and lead to higher costs. A letter more completely outlining the Department's position on this legislation is also attached to my testimony.

With regard to another issue on the Department's position on legislation concerning mixed waste, we feel at this time that further legislation concerning the regulation of mixed waste at DOE facilities is certainly premature and probable unnecessary. As you may know, jurisdiction of the Resource Conservation and Recovery Act over the Department of Energy's nuclear facilities and activities was a subject of litigation in the Eastern District Court of Tennessee. Subsequent to that litigation, EPA and DOE have been working to develop rules to identify those radioactive waste streams that are subject to the Resource Conservation and Recovery Act, and, therefore, subject to EPA and State regulations, as well as our own regulations. We are working to establish procedures by which compliance can occur consistent with our national security responsibilities.

For our nonradioactive hazardous waste, DOE facilities are subject to EPA, and we are in the process of submitting applications to appropriate EPA regional or State offices.

For those waste streams that are not subject to the Resource Conservation and Recovery Act because they are source, special nuclear, or byproduct material—those are terms that have specific technical definitions, but they are terms relating to the type of material—DOE has structured internal management programs that are to be, to the maximum extent practical, consistent with EPA regulations.

DOE Order 5480.2 provides policy direction in this area, and a copy is attached to my testimony.

I have outlined what this program is about. I submit there are few, if any, industrial enterprises in this country with a safety challenge equal to ours, and, yet, fiscal year 1984 injury and illness rates for Federal and contractor operations involved in this program were approximately two to three times better than the overall rates in the private sector. None of the injuries or illnesses in 1984 were caused by radiation exposure, and there were no accidental exposures in excess of the allowable annual limits.

In the mid-1960's and accelerating into the 1970's and 1980's, concern for the protection of the environment for future generations and the immediate effects of industrial and municipal waste disposal practices increased. What was acceptable for industrial protection nationwide in the 1950's and 1960's is no longer acceptable in many cases.

During this period, legislation and regulations extending to Federal facilities showed the need for the Department to upgrade the environmental, safety, and health practices in our plants. Additionally, concerning environmental legislation, there are some 24 major pieces that I have identified. Approximately two-thirds of them have been implemented since 1970, so this is a very dynamic area. We're trying to respond as far as we can.

As a result of this legislation, the Department is expending major resources to implement measures consistent with the requirements of the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act, the Toxic Substances Control Act, and the Comprehensive Environmental Response, Compensation and Liability Act.

As an example, the Department's fiscal year 1986 budget request to the Congress for defense programs alone includes nearly $380 million for programs related to environment, safety, and health. These funds will be used for a variety of activities, ranging from health physics to fire protection and industrial medicine to environmental protection.

This resource level has increased by a factor of 300 percent—over the past 4 years.

In summary, it is our policy to take every reasonable precaution to assure the protection of the health and safety of our employees and the public. We have taken action to strengthen the oversight of the environmental, health, and safety aspects of our facilities. We are moving aggressively to define and implement the corrective actions needed to assure that our facilities will meet appropriate State and Federal environmental, safety, and health regulations and requirements as they evolve.

The Department of Energy is dedicated to becoming a good neighbor to those people in the communities where our sites are located.

Thank you, sir.

Senator COCHRAN. Thank you very much, Mr. Cochran.

We will now hear from Mr. Joe La Grone, who is Manager of the Oak Ridge Operations Office.

Mr. LA GRONE. Thank you, Mr. Chairman.

I am Joe La Grone. Since April 1983, as a matter of fact, this would be 2 years ago, I have been manager of Oak Ridge Operations.

I'm pleased to have this opportunity to address the committee's concerns as they relate to the DOE's managment of the health and safety programs at the Fernald plant.

A complete statement has been submitted for the record. With your permission, I would like to now summarize.

Oak Ridge Operations is one of the largest and most diversified of the DOE operations offices with principal facilities and activities located in seven States. Our broad range of responsibilities covers energy research and development, production programs, including uranium enrichment, the strategic petroleum reserve and defense programs. Our activities include about 24,000 employees, of which about 700 are Federal.

Our budget fiscal year 1984 was about $4½ billion. The capital investment in these facilities is about $9 billion, and replacement costs would be on the order of $20 billion.

Today I want to focus on our responsibilities for the processing of uranium feed materials and related production of fuel cores for the U.S. plutonium production reactors.

As manager of the Oak Ridge Operations, I firmly believe that every attempt must be made to insure the safe operation of DOE facilities under my control and to protect the health and safety of the plant workers and the public.

After my arrival at Oak Ridge in late April 1983, I observed that environmental matters were receiving an increasing amount of attention from regulatory bodies. I was informed at that time that the Y-12 plant had a serious mercury situation that dated back to the mid-1950's and 1960's. There had been losses to the environment of about 650,000 pounds of mercury and almost 2 million pounds of mercury were unaccounted for. The report was declassified and was released on May 17, 1983, and received extensive public distribution.

After reading this report, I became convinced that sharper focus was, indeed, needed on past and present environmental activities throughout the Oak Ridge complex.

At the inception of forming this task force that I put together at that time, I informed them that once the mercury situation was under control, the group was to expand its problem-solving and problem-spotting activities to the entire mission at Y-12, other facilities at Oak Ridge, and as soon as reasonably feasible to expand our purview to other sites and facilities, ultimately to plants located in other States.

In congressional testimony before Senator Gore and Congresswoman Marilyn Lloyd on July 11, 1983, I discussed my commitment to work diligently with openness and candor, to identify and correct our problems and to bring our facilities into compliance with applicable standards. By conceding our shortcomings, demonstrating a willingness to aggressively address our problems, and by working cooperatively with local, State and Federal oversight and regulatory bodies, we have made significant progress.

In addition to the environmental problems at the Y-12 plant, I was simultaneously faced with addressing other matters that had to have immediate attention, such as upgrading safeguards and security at the Oak Ridge Y-12 plant; addressing similar programmatic, environmental and safeguard issues at the three gaseous diffusion plants and the Oak Ridge National Laboratory; assuming a leadership role in redefining the uranium enrichment structure of this country, and assuming, in June 1983, responsibility for fuel oversight of the strategic petroleum reserve project office, which included extensive efforts to strengthen the management, both Federal and contractor, as well as investigate all allegations of waste and fraud since the inception of the project.

As unacceptable practices and policies were identified primarily at the Oak Ridge Reservation, they received priority attention. As these were addressed, we tried to move methodically to identify other facilities needing attention. One of these is the Fernald facility.

On April 13, 1984, I established a task force to review operations at Fernald in order to begin to better understand the problems at the plant and to begin to develop corrective plans and actions.

The following areas were assessed:

First, the ability of the Fernald plant to operate reliably over the next 15 to 20 years at projected production levels, including current and planned restoration activities.

Second, environmental protection and waste disposal.

Third, fire protection and industrial safety.

Fourth, management commitment of NLO to implement required changes, including staffing.

Fifth, the need for permanent DOE staff onsite at Fernald.

This plant, as you know, began operation in the early 1950's and its principal product, as Mr. Cochran has discussed, is uranium metal for use at other DOE facilities.

The initial investment and construction project was about $117 million, with an expansion of $60 million in the mid-1950's. Activities at the plant peaked in 1960, and then in 1964 began to decline. During the 1970's when consideration was given to closing the plant, capital improvements and staffing were minimized. Then in 1981, planning for the restoration began to accommodate projected product requirements that were to grow to near the originally installed capacity of the plant.

This transition included significantly increases production levels, rapid staff buildups, and implementation of a major facilities restoration program.

As of about now, accomplishments include production output of 288-percent of the 1979 level, a staff increase from 538 to over 1,000, and the initiation of over $70 million of capital facility improvements.

During the past approximate 30 years of FMPC operation, uranium, through process losses, was released to the environment as has been stated. We identified that to the Congress and to the public back in December. The total discharge to the air was about 95,000 kilograms of uranium and about 75,000 kilograms to the water. An additional 5 million-plus kilograms has been disposed of in onsite pits. Large volumes of contaminated scrap have also been sent to the plant for storage. There are also three concrete silos of solid waste; one contains low-radium content metal oxides, and two contain high-radium content uranium ore residues left over from material processed earlier at Fernald or shipped to that site from other locations. In those two silos are about 20,000 kilograms of material, plus there is material unaccounted for on the order of in excess of 330,000 kilograms of material.

The Oak Ridge task force, as I mentioned earlier, completed its report in June 1984, briefed me and the senior management at Oak Ridge in early July, briefed the people in Washington during the month of July, and I believe it was turned over to the program organization formally; in September 1984, however, I directed the program organization in the interim to go ahead and proceed with implementing the changes called for, primarily to get a plan of action from the contractor to correct the deficiencies outlined in this report.

The intent of this report was to establish a base line for future actions, what needed to be done, what needed to be corrected, what needed to be fixed. It was not aimed at the award fee situation. And it was never our intent to disguise any of the information in that report.

We had done a similar operation on the strategic petroleum reserve where we identified about 175 recommendations that needed to be corrected, as well as prior accusations of mismanagement, of waste, fraud, abuse, et cetera. On the order, I believe, of 500 to 600 allegations that had been made.

My point here is that we submitted this particular report on uranium losses to the Congress on March 25. Perhaps naively, from the number of public meetings that we have had, and the press conferences we've had, I assumed that everyone knew that the particular uranium off site in those wells belonged to the Department of Energy or had come from our operations.

It has always been clear in my mind since I learned of the situation that the slightly enriched uranium did come from our site. Now, when it came there and what the specific source is, I don't know, but, as you know, that has been the subject of studies done by Dames & Moore, and we have also requested the contractor to expand the analysis of those water samples to look for other materials.

Going to the most recent large release at Fernald, on December 7, I was informed of a uranium release from the Fernald center as a result of a malfunction of the plant 9 baghouse air filtration system, and that incident had gone on from about mid-September to December 6, 1984. I immediately directed an investigation, and established an investigation board, which was charged with determining the causal factors that contributed significantly to those releases.

We reported the release to the National Response Center and the Ohio EPA on December 7; issued a press release that day, and on December 13 held a public meeting to inform area residents of the scope of the DOE investigation and to better understand their concerns.

NLO, following the shutdown of the plant 9 baghouse, on December 7, undertook correct give actions. Operations were restarted on December 12, and continued normally until the morning of December 14, when instruments indicated that the baghouse might again be malfunctioning. They shut the unit down, and the analysis indicated that, in fact, there had been a small discharge. However, it was my judgment at this time that the plant should not be restarted until an outside group of experts on air filtration systems could conduct a thorough review. Again, the appropriate agencies were notified, and an onsite press conference was held that day.

As a result of an intensive inspection of all major process ventilation systems, NLO made a decision to temporarily shut down a part of building No. 5. That was because of marginal performance of two of the facilities' bag filtration systems.

On December 18 and 19, an outside group of experts carried out an inspection of the major process ventilation systems. All "near-term" recommendations by these experts were or have been accomplished. The experts have revisited the site to verify that their recommendations were met satisfactorily. And, as Mr. Cochran indicated, our target date for restart of the plant is May 1, and before we restart that plant on May 1, my intent is to have the outside experts revisit the plant again, along with DOE safety, environmental, and other folks, to look at, and check, and reverify that everything, in fact, is in place before that plant is started up. We also would intend to stage up the operations of the plant and not bring it all up at one time.

Because of expressed concerns of area residents regarding possible internal contamination with uranium, because of the December incident, we provided a whole body counter so that the citizens on a voluntary basis could be checked. Our technical staff informed me that this counter offered the best means to quickly determine if uranium had, in fact, accumulated in the body over an extended period. About 90 members of the public were counted and no uranium was found above what would be considered background levels.

The counter is routinely used at our facilities to count employees, workers at Fernald, and employees of subcontractors at that plant were also counted while the mobile counter was at the plant.

As a result of the review of the December release, NIOSH recommended that four NLO employees be sent to DOE's Argonne National Laboratory for comparison whole body counting. The results obtained from Argonne were inconsistent with the uranium isotopes in use at Fernald, and, thus, the results are presently confusing. NIOSH is proceeding to work at this problem and try to clarify this inconsistency, and we're prepared to support and help in any way we can.

On February 6, we issued our report on the investigation that occurred between September and December. We briefed the appropriate committee staff, held a news conference here in Cincinnati, and also followed up with a public meeting.

The investigation report contained a number of recommendations. Let me quickly summarize those:

One, all "near-term" recommendations, as I mentioned, by the outside experts have been accomplished. Action plans are being developed to implement long-term recommendations.

Two, key staff at Fernald have been instructed on reporting requirements of DOE and other Federal agencies. Their reporting to DOE and the public, in my judgment, is now more timely and shows an increased sensitivity for the necessity of early and full disclosure. NLO has also hired a public information specialist, and plans are underway for a series of plant tours for employees, their families, and the public.

Three, NLO is hiring an overall environmental manager, and has made some staff changes, and is recruiting to augment health physics capability. In the meantime, DOE, from one of our other contractor organizations, is providing technical expertise in this area.

Four, the internal reporting system at Fernald has been improved to insure that environment and worker health and safety concerns are brought directly to the plant manager's attention.

Five, all of our contractors within the Oak Ridge complex, using bag filtration systems, have been provided with the investigation findings.

Six, we and NLO are identifying opportunities to upgrade uranium emission control technologies. We have accelerated the schedule for upgrading the plant 9 dust collection system, including the addition of high efficiency filters. We expect that there are other opportunities.

And later we hope there is an opportunity for questions and exchange, and I would hope Mr. Reafsnyder, the site manager, will have an opportunity to talk about some of the things we're trying to do to accelerate improvements and upgrade that deployment.

As a part of improving our oversight and coordination, we have, in fact, established a site office, which Mr. Reafsnyder is the manager of. He is the equivalent of a division director and will report directly to an assistant manager.

We have recently hired a second engineer full time who reports the first of May. In the meantime, we have another engineer on detail helping him.

There has not been a DOE onsite manager present at the plant since about 1973. In my judgment, that has—not to point fingers—contributed to some of the problems in terms of our not doing a good job of oversight that we should have been doing all along.

Beyond that, the Oak Ridge staff is available to provide other needed expertise and I have made them all aware to give priority attention to FMPC requests.

We're also using other contractors to provide assistance on a quick turnaround basis—contractors like some of the people from Y-12, from the Oak Ridge National Laboratory, and Oak Ridge Associated Universities.

The investigation report that was issued on February 6 by our group also found that the Oak Ridge contractor appraisal system—our appraisal system—had not been effective in identifying the principal factors leading to the release of the uranium.

Let me talk about that for just a moment, because after becoming aware of some of the environmental problems after I arrived at Oak Ridge, in August 1983, I put together a committee to review our entire appraisal system.

In mid-1984, I was briefed by the committee, and one of the principal findings of that committee was that our existing contractor appraisal program was not identifying chronic or major problems to management early enough to avoid the potential for them to reach the crises stage.

As a result of that, I have directed that we would have a better appraisal program, and that our appraisers will assure, among other things when they go into the workplace to make sure that the work is being done, that it is being done in a safe and environmentally sound manner, and that appropriate considerations are given to safeguards and security.

Every employee in the Oak Ridge complex has been encouraged to raise problems as soon as their spotted. Our plan is to have that new appraisal system in effect by the end of June 1985. And, specifically, the major difference is that it's designed to better identify vulnerabilities and risks, and to raise them to the appropriate management at an earlier and more timely manner.

I have also directed the heads of our major contractor organizations to strengthen their internal audit programs and to inform us of actions that they have taken or planned to take to achieve that.

Shortly after the 1984 uranium release at Fernald, I wrote the parent company of NLO to express my deep concern that this event was not reported to the public, to the regulatory bodies, or DOE in a timely manner. In subsequent discussions with NL Industries, Inc. I informed them of my decision to recommend to DOE headquarters that the contract for the operations of the plant should be competed to include a wide participation of qualified organizations. NL Industries indicated that they would not compete for the new contract, but did agree to a 6-month extension of the present contract through March 31, 1986, so that an orderly transition can be accomplished. That will happen about April 1, 1986, when we bring the new contractor onboard.

I appreciate the manner in which NL Industries has responded to help and their pledge of full cooperation during this period where we have a lot of problems to deal with.

On March 1, 1985, at a presolicitation conference at Fernald, we outlined our expectations of new contractors. And among these are, first of all, responsibility for construction activities in an efficient and timely fashion.

Second, the operation of the facility in an environmentally safe manner.

Third, development of a strong public information and community relations program, and corporate backup in the needed areas of expertise.

The RFP will be issued by April 30, and we expect to receive proposals by July 8, 1985.

Following selection of a contractor, we intend to negotiate a 5-year cost-plus-award-fee contract. Under this type of contract, the Government pays for all legitimate costs of operations, and then pays a fee to the organization commensurate with performance. The award fee plan of the new contractor will be better structured, and I repeat better structured, to emphasize the importance of safety and environmental protection programs.

Both safety and environment have been assessed in the past under the NLO award fee plan, and a composite of those evaluations, with greater weights for production activities, have resulted in less than adequate visibility, in my judgment, of this key operational area.

More specifically, in 1984, fiscal year 1984, there were five functional areas assessed. They were production operations, safety and environmental control, maintenance management, budget and engineering.

The award fee plan for the first half of fiscal year 1985 retained the same five elements, but added three others. And these are safeguards and security, small and disadvantaged business procurement, and industrial relations.

Following the uranium emissions between September and December 1984, I determined that environmental matters would be given greater emphasis in the award fee structure than they had in the past by setting it out as a separate element in the evaluation plan. On December 18, I informed NLO management this change would take effect for the second half of fiscal year 1985 since the plan has to take effect and be put into effect 30 days before the 6-month period occurs.

In retrospect, even though safety and environmental control was an area of evaluation in the past, management oversight at Fernald, in my personal judgment, would have been far better served had environmental management and protection been a separate area for review all along. Environmental control and management heretofore has been under one common heading that includes, I believe, 9 or 10 subelements, and, therefore, the importance of environment has tended to have been offset by other higher ratings of industrial safety, fire protection, et cetera.

The overall award fee rating of "excellent" which NLO received for the first and second half of fiscal year 1984, as I mentioned earlier and as I reported to the Congress in our letter I believe, March 25, 1985, was due to the amount of weight assigned to production operations versus the other areas.

Obviously, we, and in this case, I will emphasize for the record that I have learned some lessons from this experience.

The importance of producing acceptable products continue, but we're also committed to achieving a better balance in the evaluation factors. To that end, let me talk for just a moment about the change in procedure.

Heretofore, the Award Fee Board performance evaluation committees have compiled what I call a staff paper, forwarded then through the process, and then I reviewed this or if I had particular questions, we basically acted off staff papers.

The change that I have implemented now on award fee evaluations is the deputy manager and I sit down face-to-face with Award Fee Board members, and the Chairman of the Performance Evaluation Committees, to talk about areas of concern to make sure that the proper reflection and weights have been assigned, and make sure that those areas that are of personal importance to me get the proper attention. That is the basic difference in how we've done business than from the past.

Not only environmental matters, but worker safety and working conditions are also receiving increased attention by the Department. During the week of March 6, 1985, a DOE headquarters task force conducted a review primarily related to worker health and safety. As soon as we receive that report, we will proceed expeditiously to implement the task force recommendations. There are several recommendations I know that are set forth in there which offer improvements. And I believe that report is due out in about another week to a week and a half.

As a result of another recent onsite review by another DOE headquarters organization, it came to my attention that when recycled material from another DOE facility was processed at the Fernald plant in 1982 there were higher than normal levels of plutonium and trace element contaminants.

And I would say to Mr. Luken and to Senator Glenn, at the time that I saw you and met with you, I did not know about that particular matter of plutonium, and I have to apologize for that. I do want to bring to your attention, if it hasn't been already, that in 1982 there were materials produced that had higher concentrations of plutonium in those particular materials.

We have directed, in the meantime, that only recycled material containing less than 10 parts per billion plutonium will be processed pending the outcome of a joint Oak Ridge headquarters study. The first task of that study group is to look into the 1982 processing of those materials. Those materials were shipped in about 1980 from the Paducah plant to Fernald plant, and were processed during 1981 or 1982, or thereabouts.

The second basic task of this group is to review and recommend maximum levels for processing recycled material. We expect to have a report in about 45 days, and we will provide that for the committee.

I plan to continue our practice of keeping the Congress, the residents near the plant, and the plant workers fully informed of actions that we are taking, as well as any historical information that we dig up; for example, like the February 1966 report of release of uranium hexafluoride gas, which we submitted to the Congress within the last couple or 3 weeks, as I recall. There were about 3,000 pounds of material produced at that point in time.

As a part of keeping the public and people in the area informed, I have directed the site manager to establish somewhere in the area of Fernald what I call a public reading room where we can put on record all of the material that has been provided to the Congress, whether through letters or testimony, as well as all information coming out of studies. It can all be deposited there, and anyone who wants to come and see that material can do so. That is one of the things we have done at Oak Ridge.

A second thing we are working with the contractor in doing is establishing a citizen's advisory group for the contractor, so that the contractor will have the benefit of input of the views and concerns of the citizens.

Let me just talk for a moment about some of these other things that we have tried to do recently in improving the situation at Fernald.

We have negotiated an agreement with the Ohio Department of Health for an analysis of private drinking water supplies and interpretations provided to the residents directly by the State.

We are evaluating onsite and off site monitoring programs. One early recommendation is to deploy new air monitoring equipment at additional locations, and we are also looking at air monitors for inside the plant area as well.

Beginning this week, a DOE helicopter will begin a 2-week radiological survey of the plant and the surrounding area. The aerial survey will supplement our accelerated efforts to obtain expanded environmental data. The previous overflights that were done were in late 1976 and 1977, as I understand it. I intend to submit a copy of that 1977 report to the committee. We will also, obviously, submit the data out of this most recent overflight as soon as it is available.

For the debriefing on that, which will occur at about the end of the 2-week period, it is our intent to invite representatives from the State of Ohio, as well as from the Environmental Protection Agency, region 5, to participate and to hear that debriefing.

Meetings have been held with representatives of the Ohio Attorney General's Office, and the Ohio EPA, to address violations cited by the Attorney General related to activities at Fernald. Our response has included descriptions on how Fernald was either in substantive compliance or how Fernald was trying to bring itself into substantive compliance.

The State, the contractors, and DOE representatives have agreed to exchange documents dealing with environmental reports, chemical assays, and constituent formats, and other more general information.

Questions raised by the State personnel arising out of their document review were addressed, and additional documentation is being provided. Another meeting has been tentatively set for mid-May.

On March 9, 1985, the Regional Administrator of the U.S. EPA in Chicago wrote me a letter expressing concerns about Fernald. Among the areas he mentioned were radiation monitoring, radioactive air emissions, groundwater monitoring, possible contamination of drinking water supplies, and NPDES permit monitoring requirements. I have written the Regional Administrator and informed him of my personal commitment to correct the situation at the plant. Second, I informed him that EPA, Region 4, had been extremely helpful to us in dealing with the serious environmental problems we have at Oak Ridge, and that the State of Tennessee has also been extremely helpful.

It is my fondest hope and intent that Oak Ridge can achieve, with EPA, Region 5, and the State of Ohio, the same kind of working relationships that we have in Tennessee and with region 4.

I want to emphasize that we're committed to an environmental management program for the Fernald plant similar to the study that we prepared for the Oak Ridge Reservation and submitted to the House Science and Technology Committee.

This particular document is what I call a living document. It was done and completed in February 1984 for the Oak Ridge Reservation.

As we learn more, as we develop more, it's updated, budgetary numbers changed, other areas of concentration focus changed. The total estimate to clean up Oak Ridge in this particular report at that time was on the order of $800 million. We do not have a handle on what it would cost to clean up Fernald, but, obviously, it's going to take a lot of money, and we will be coming to you with those requests as we develop this plan.

To do this kind of plan and do it right, in my judgment, is going to take on the order of 6 months to 1 year. The plan is going to address environmental problems and resolutions identified by the following categories: First, radioactive waste; second, hazardous waste; third, contaminated waste—that is, hazardous and radioactive contaminated; fourth, conventional waste; fifth, monitoring; and, sixth remedial action, such as the waste pits, the silos, and the scrap metal.

As I said, based on my experience with the Oak Ridge situation, it will take at least 6 months to 1 year. We will select a contractor, or an organization, or a laboratory to do that study for us.

Admittedly, in conclusion, we have a long way to go in solving our problems at Fernald and elsewhere within the department, for which I am responsible.

Even though we are dealing with a 30-year old plant, we will not allow these past practices to continue. This is 1985, and in my judgment, we are working diligently with openness and candor, to identify and control those problems and to assure that Fernald is in compliance with applicable standards. Beyond that, we must and we will do a better job of providing oversight of plant operations and executing our responsibilities.

As a part of that, since I've been at Oak Ridge, I have increased the environment, safety, and health staff by about 25 percent.

By working together, I believe we will be successful in these endeavors.

To reflect on a point that one of the Members made in an opening statement, I fully realize that Congress, the public, and the workers are expecting us to perform, and no manner of words of assurance and rhetoric alone will be solutions to the problems; only performance will be the solution.

I assure you that Secretary Herrington personally agrees with this statement. To that end, I, and the administration that I work for, pledge full cooperation, collaboration, and personal commitment to undertake the necessary actions.

I will be pleased to answer any questions the committee has.

Senator **Cochran**. Thank you very much, Mr. La Grone.

We will now hear from representatives of National Lead of Ohio.

Let me ask you to please, if you can, restrict the length of your presentation to the committee to 10 minutes or less.

We will recognize, first, Mr. Robert M. Spenceley, the Fernald plant manager.

Mr. **Spenceley**. Thank you, Mr. Chairman, Senator Glenn, Congressman Luken.

My name is Robert M. Spenceley. I am the manager for NLO, Inc., the company which has had the contractor responsibility at the Feed Materials Production Center at Fernald for the past 34 years.

Gentlemen, I want you to know that we are deeply grateful for the privilege and opportunity to come here today and tell our story regarding the Feed Materials Production Center to our elected officials and to the people for whom we have worked so hard, and we believe, so well for so long. This is the first opportunity we have had to contribute in a comprehensive way toward a public understanding of the health and environmental issues at the Feed Materials Production Center.

Before I begin to address the four areas of interest suggested by Senator Glenn, I would like to characterize NLO's contractual relationship with the DOE and its predecessor agencies. An early AEC report to the Congress describes it as resembling relationships between industrial companies and their branch offices. The DOE establishes the objectives and makes the decisions required to fit the operation into its national program, and exercises the controls necessary to assure security, safety, desirable personnel administration, and prudent use of public funds.

You have asked us to come here today and present testimony in four areas that Senator Glenn specified to us in his letter of April 4, 1985. We have prepared written testimony addressing these areas.

I have with me Mr. Michael W. Boback, former director of NLO's health and safety division, and, more recently, special assistant for environmental matters on my staff.

My purpose today will be to summarize for you the written response to the four areas on which you have asked us to present testimony.

Area number one was concerned with our understanding of DOE's requirements in the area of health and safety for employees and residents in nearby areas, including documented evidence that DOE found our performance in keeping with its requirements.

In summary, DOE requirements for environmental safety and health protection programs are contained in a series of DOE orders which are part of the DOE Directive System. These orders establish policies, procedures, and standards for prime contractors, such as NLO. Of course, they are supplemented with announcements, directives, and letters.

The major orders dealing with environmental, safety, and health matters are DOE and OR 5480.1A. In slightly more than 250 pages, these documents give the basic elements of required environmental, safety, and health programs and set maximum limits for radioactive discharges and safety parameters for radiation exposure of employees as well as the general public.

As far as rating our performance, up until the late 1970's, programs were rated as either satisfactory or unsatisfactory. Then a change in measuring contract performance was introduced by expanding the classification as follows: They became poor, marginal, satisfactory, excellent, and superior.

In each of the past 10 years, DOE, Oak Ridge Operations Office, has found NLO performance of environmental, health, and safety functions to be satisfactory or better, with one exception. We received a poor in the health physics program in 1980. Since that time, the health physics program has been rated satisfactory.

The overall Environmental, Safety and Health Program is additionally rated semiannually by DOE, Oak Ridge Operations as a part of the award fee contract protocol. Out of 77 ratings actually assigned, 10 were superior, 50 were excellent, 14 satisfactory, and 3 poor. We have concluded that there has been overall satisfaction with NLO's performance in these functions.

In the second area you asked for our view of the performance of NLO in the area of health and safety at the FMPC, identifying the strengths and weaknesses as we see fit.

It has always been the prime objective of NLO, Inc., to conduct operations in a manner that does not have a deleterious effect on employees health or the off site environment. While recent publicity might make it appear to the contrary, the fact is that NLO has met all applicable standards for radiation exposure of employees and the general public. Plans were begun several years ago to meet the anticipated standards of the EPA. Some of these standXrds were recently adopted.

Our safety record has always been very good when compared to industries in the same National Safety Council classification. Our average for lost-time injuries is about one-fifth the average rate for the nonferrous metals group.

In the 30-year period between 1954 and 1983, NLO has received 69 awards from the National Safety Council, the State of Ohio, our parent corporation, the Atomic Energy Commission, and DOE.

There have been numerous audits and investigations of our health and safety program, and in no case did the findings show that our program was in need of basic overhaul. In the most recent review in February of this year, the report said that there was, "No reason to suspect that serious health threats exist at the FMPC,"

Gentlemen, this company has a good health and safety record, and by every measure we have, there is nothing we know of that says we are a threat to the health and safety of our employees and our neighbors.

The third area that you asked us to address was NLO management characterization of the relationship between management and labor at the FMPC, and the effect of worker concerns about occupational health and safety on that relationship.

The quality of the labor-management relationship can usually be inferred from the number and severity of work stoppages and walkouts by employees. The FMPC workers have always been represented by a council comprised of AFL–CIO unions, each with the support of their international union. Remarkably, the last strike at FMPC was in 1966, almost 19 years ago.

Furthermore, there was only one work stoppage, and that affected only a few employees and was of a short duration during 1969.

A record of one strike and one walk-out over a 19-year period, where some 16 unions are involved, is an excellent record by any standard.

Labor-management relationships usually deteriorate when employees view their workplace as oppressive or hazardous. Such a relationship would inevitably be communicated to the community. Since 1981, there have been some 1,200 job vacancies at FMPC. More than 42,000 applications were received for those jobs, an average of 35 applicants for every opening. I suggest to you that the community believes that FMPC is a good place to work.

Another positive indication of the good working conditions at the plant is the number of employees who have members of their families also employed. At present, 203 of the 1,083 FMPC workers are from the same families. We also have 29 additional workers with close family members who are NLO retirees.

Our perception that the labor-management relations at FMPC are generally good has been recently challenged by the new union leadership. We believe that the facts support our position and we do not believe that the recent union leadership criticism of NLO is representative of the membership's assessment. The fact is that 5-percent of the workers control almost 40-percent of the vote in the union council, composed of representatives from 16 locals.

In summary, we believe there are simply no indications of a deteriorated labor-management relationship, other than the subjective recent contentions of some union officials to the contrary.

The fourth and final area that you asked us to address was NLO management recommendations on improving labor-management relations and improving operations of the plant so as to meet the concerns of workers and citizens living in the nearby areas.

NLO management recognizes the need to improve relationships with the present union officials at the FMPC. Again, I would emphasize that management views the overall relationship with hourly employees as highly satisfactory.

Union leadership is supporting new legislation covering health and safety measures in the uranium industry. In furtherance of that goal, union leadership has made public statements reflecting conclusions which management finds at variance with the facts.

They have alleged that management has deliberately distorted monitoring results, has used inappropriate radiation standards, and has failed to protect the health of FMPC employees. The company categorically rejects these accusations as being false.

Still, we have taken and will continue to take numerous steps to improve communications with employees. In response to union-expressed concerns over their greater involvement, we have increased the company-union safety meetings from quarterly to monthly, and have increased the time allotted for each meeting by 67 percent. We plan to hold plant tours in the near future. We have always had an open-door policy for employees, and we intend to open the door even wider.

We will also be implementing plans to foster better community relations with a number of new initiatives. Community relations will have a much higher priority in the future.

As to what we have done, or are planning to do, to improve operations at the plant, there is a long list in the prepared testimony that time does not permit me to address in its entirety, but which includes increased inspection procedures, additional monitors, and a restatement of the requirements to shut down a process on the first indication of a problem. We have stepped up our notification process for unusual occurrences and plan to install new filters. These improvements will further reduce airborne emissions.

Many environmental projects not yet implemented were formulated prior to the events of late 1984 which have led to the current concern.

From the community standpoint, the levels of uranium in three off site wells has caused much consternation. While the level remains well below the DOE standard, we began addressing that problem in 1981 when the presence of uranium was first detected, and we notified all regulatory agencies and property owners at that time.

With DOE approval, we initiated a hydrological study by the U.S. Geological Survey. When that first study failed to determine the source of uranium, a second study was authorized. Results from this second comprehensive study will be available in mid-May. This survey is intended to discover the possible source of uranium and to recommend corrective action. We have also started action to remove waste from six in-ground waste pits.

Time does not permit a discussion of all our improvement projects. However, I want to point out to this committee a fact that has been largely overlooked in the controversy surrounding this plant. There are plans, current and future, to spend some $350 million to modernize and upgrade this plant.

Planning for these projects began in 1982, and funding was requested as early as January 1983. Some of the work is underway now. More will be done, as additional funding is made available.

We solicit your support of funding to modernize and upgrade this plant. We believe the physical condition of the plant is our number one problem, and we are anxious to participate in a program that will make the FMPC a more efficient plant and one which will continue to be a safe place to work.

Thank you for the opportunity to present this brief presentation on the FMPC, and now we will be happy to address your questions.

Senator COCHRAN. Thank you very much, Mr. Spenceley.

In looking at the notes that I made during the testimony of the representatives from the Department of Energy, I get the impression that all of the screening and review of possible harmful effects that might have been caused to workers and the general public in the area of the facility have satisfied you that there has not been found any evidence of any harmful effects to the public as a result of these screening tests. Is that a correct and accurate statement?

Mr. LA GRONE. To the best of our knowledge, that's true. There are things that we are still learning. We want to get the best information we can, and have it analyzed by the best people and organizations. We will make all of our data available to the public to assure ourselves that that is the case.

Senator COCHRAN. Well, I was wondering how that would be consistent with the testimony that there are substantial amounts of waste that you have found at this site and you don't know what they are. Is there reason for alarm because you can't identify this waste, or are we to be satisfied that it's not harmful?

Mr. LA GRONE. Sir, I would respond to that in two ways.

I don't know of a reason to be alarmed, first of all, but I would say that that is not sufficient reason for us to sit still and do nothing. I personally think we have to get on with characterizing what's in those pits, doing more water analysis. Now, I'm talking about onsite, as well as off site consequences.

In terms of worker safety, which I believe Mr. Cochran was addressing, I did mention that there was a DOE task force out of headquarters headed by Dr. Gilbert at the Fernald plant about the first week in March, and they basically did what I call a health physics review. It was a multidisciplined, multiteam member group, and I know from the briefing that I got that there are some improvements they are recommending. Where they come down to in terms of the bottom line, I don't know what their bottom line is.

Senator COCHRAN. Mr. Spenceley, in your testimony you mentioned that NLO has met all applicable standards for radiation exposure, and that the safety record at the plant has, in your words, been excellent. In connection with that, did you support or oppose the closing of plants 5 and 9 because of the potentially harmful consequences for uranium radiation?

Mr. SPENCELEY. The plant would not have been closed in past years—past months for releases, such as were reported on December 7.

Senator COCHRAN. So, it's your contention that those plants were closed unnecessarily; that there wasn't a justification by reason of uranium particles in the air that justified that?

Mr. SPENCELEY. In the past years, we have not considered releases of that magnitude reportable to the DOE, nor injurious to the health of our workers, nor the surrounding populous. We have numerous readings from our several boundary monitors that indicate little or no increase in the uranium concentrate in the air when we are experiencing one of these problems. This supports our contention that the material is not injurious to the people.

Senator COCHRAN. Senator Glenn.

Senator GLENN. Thank you, Mr. Chairman.

Mr. Spenceley, following up on that a little bit, how many boundary monitors do you actually have?

Mr. SPENCELEY. We have seven.

Senator GLENN. Seven. How many have been recommended to really give adequate coverage for the site?

Mr. SPENCELEY. There's no additional ones being recommended for boundary, but we are adding 2 to 4 additional monitors off site; 2 will be located—1 at the Elda School in Ross and 1 at the Crosby Township School—in addition to 2 other additional monitoring stations monitored by the Ohio EPA will be established.

Senator GLENN. They will install them and monitor them, is that correct?

Mr. SPENCELEY. They will install those 2 and monitor them, yes.

Senator GLENN. What about onsite, do you have outside the perimeter monitors there? Do you have a number of monitors onsite?

Mr. SPENCELEY. We have few, if any, monitors onsite at the present time. We intend to install additional monitors in the process area in the various buildings for a continuous air sample.

Senator GLENN. You mentioned the uranium monitoring, the radiation monitoring off site, and the water, and so on, when did that become apparent? When did you first know about that, or when did NLO first know about it?

Mr. SPENCELEY. Are you referring to the uranium in the wells situation?

Senator GLENN. Yes.

Mr. SPENCELEY. We learned of that late in 1981.

Senator GLENN. But as I understand it, it's your contention that is still below—what's been measured so far is still below the DOE limit?

Mr. SPENCELEY. That is correct.

Senator GLENN. How about EPA; do they have a separate standard for that?

Mr. SPENCELEY. EPA does not currently have a standard for that. They have a proposed standard, and we would be above the proposed standard.

Senator GLENN. Would you drink water from that well?

Mr. SPENCELEY. Yes, I would. I'm drinking water, and have, for 33½ years from similar wells and the same aquifer onsite.

Senator GLENN. Downstream in that aquifer?

Mr. SPENCELEY. Pardon me?

Senator GLENN. Down the stream in that aquifer?

Mr. SPENCELEY. Now, the production wells are located to the east of the pits, but they're in the midst of the aquifer.

Senator GLENN. Where does your water come from onsite? Does it come from wells onsite?

Mr. SPENCELEY. Yes.

Senator **Glenn**. I presume, though, that drainage out of there would go downstream, and the aquifer probably would—would not get into the aquifer level right onsite, is that correct?

Mr. **Spenceley**. You're getting beyond the level of my expertise.

Senator **Glenn**. My own, too.

Mr. **Spenceley**. The general circulation of the water in that aquifer is from northwest to southeast, and that exhausts my knowledge.

Senator **Glenn**. In your testimony, you say that over the past 10 years, DOE has found NLO's performance to be satisfactory or better, with one exception or a couple of exceptions where you were downgraded to "poor" out of all those appraisals you've had through the years, but would like to read part of the report that was provided at that time by the appraiser.

The report states that "Based upon review of the radiation exposure data for 1979 and the NLO investigation report regarding a quarterly overexposure, it appears that the exposure control program has deteriorated rather than improved. The basic health protection performance objectives are still not being met. There has been no improvement in the overall external exposure picture as compared to the 3 previous years and 80-percent increase in the last 3 years in the number of individuals with exposure to the lung greater than 50-percent of the annual standard."

"NLO investigation report reveals fundamental deficiencies"—and I'm still quoting—"fundamental deficiencies in radiation protection in plant 5, although not specifically recognized in the report, the exposure data indicates that the individual who received the overexposure was not removed from work involving radiation exposure immediately on determination of the overexposure. As a result, additional exposure was received during the quarter, further violating the standard."

"The existence of fundamental program deficiencies, and deteriorating radiation exposure situation, and the apparent lack of aggressive response to the appraisal recommendation noted earlier, leads to the conclusion that the health physics program during evaluation periods was substantially less than standard, and, therefore, it's judged poor."

That's not a very good description—can you tell us what the overall rating for NLO was during that period?

Mr. **Spenceley**. I can't tell you what the overall rating was for the period. It was poor in this area, and we acknowledge that. In the year following, or in the next half year rating period, it had improved to satisfactory.

Senator **Glenn**. I'm told that the overall rating was excellent, and that you were, in fact, given a substantial award fee for the period that I just described there.

Mr. **Spenceley**. I think that is correct. Just a moment.

You have reference to 1980, is that correct?

Senator **Glenn**. 1979.

Mr. **Spenceley**. 1979. We have a rating in health physics for both the first and second half of fiscal year 1980.

Senator **Glenn**. It's the overall rating I was referring to.

Mr. **Spenceley**. The overall rating, I do not have with me. I'm sorry. We will have to make that available.

Senator GLENN. You will furnish that for the record. OK, fine.

From our DOE representatives here this morning, let's go back just a little while here. I know we're talking now about—we're mainly concerned about releases which took place in September and December of 1984, some 275 pounds of uranium, we estimate. We're all concerned about that and should be.

Going back, though, do you know whether the old AEC tried to take any action after learning that in just 1 month, way back in 1956—and, granted, that's getting quite a ways back—but with uranium half-life being several hundred thousand years, the problem with it hasn't gone away in some 28 or 29 years, whatever that is. In the single month of January 1956, there was supposedly a release from the stack of some 8,000 pounds of uranium. What do we know about that, and what action was ever taken on that? Anything?

Mr. LA GRONE. Sir, I would not have any knowledge of what was taking place in 1956 at that plant, nor have I delved into the records to try and find that out, if a record even exists today. That's not copping out on the question, but I truly do not know.

Senator GLENN. The records exist all right.

Mr. LA GRONE. I'm talking about in terms of what actions the AEC may have taken or considered taking at that point in time.

Senator GLENN. Yes. Well, I'm concerned that with emissions like that in the past, or dumps on the atmosphere and into the local community like that in the past haven't dealt with yet, really, and we should be going back and looking at this, and doing some epidemiological studies, and get CDC involved, the people who are pro's in this area. We've had a thing building up for a long period of time. We're concerned about the 275 pounds of uranium emitted last fall that happened on your watch, but I'm also concerned about any residual long-term deleterious effects that may still be in the community.

Mr. LA GRONE. We would have no objection to CDC doing studies, sir, and coming in. As a matter of fact, we also invited them to come into Oak Ridge when there was mercury that had been released, as I mentioned, about 2½ million pounds.

Senator GLENN. Are you happy with your awards program now in the administration of the contract, and do you think it's been improved? I know you've made reference to that, and I have a number of instances here that I will have into the record here that we don't have time to go into all of them this morning, but I've been concerned about this. It seems that we get into the habit of just automatically marking people "excellent," or we grade and we give them an award, and that's that. And, yet, your own reports out of DOE have indicated less than satisfactory performance, and at the same time we give them an award that would indicate they're "superior" or that they don't need to make any—or take any action to really improve their operation.

Mr. LA GRONE. Senator, can I take about 1½ minutes to try to talk to that point, and use a couple of view graphs I have here to speak to that point?

Senator GLENN. Sure.

Mr. LA GRONE. Thank you.

Senator **Glenn**. While you're getting set there, let me just read this statement which demonstrates my concern.

The task force review of operations at FMPC, this report of just last year, June 1984, detailed a number of deficiencies with NLO management, and this is just a partial listing: "One, operator training program inadequate, needs to be vastly improved higher than normal accident rate, appears to be a lack from that; two, their maintenance backlog, very large, estimated at approximately 94,000 man-hours; No. 3, appears to be a pervasive attitude"—and this is out of your own report—"pervasive attitude by NLO management staff that they do not have any problems; that is, they're continuing to operate, obviously, noncompliant facilities with no serious plan to implement corrections." I am still reading out of your report. "Four, and the past operating philosophies and uncertainties of FMPC by NLO and DOE place constraints on personnel and equipment for health protection, safety, and emergency preparedness, and allowed the health and safety activities to fall behind."

"Five, the past practices and attitudes of NLO are still reflected in the low-level concern it expressed on environmentally related issues." That's still out of your report.

I would read that as an indictment of NLO management practices in the areas of health and safety, and environmental protection. I would think that someone at DOE would have been all over their backs with a report like that, and instead of that, you gave them an award fee of a million dollars or so.

Now, how do we justify that?

Mr. **La Grone**. If I might speak to that point for just a moment, sir. That particular report, as I mentioned, was an effort aimed at base-lining the conditions that existed at Fernald in 1984. I had heard, talking to different people as we went through environmental problems at Oak Ridge, and the cleanup of the strategic petroleum reserves, and as I asked people questions, what other problems are lying out there in the bone pile; that there were offsite water contamination problems at Fernald; that there were pits at Fernald.

But, beyond that, I wanted this particular task force to give me a base-line report that looked not just at environment, but take a look across the board at all the operations at Fernald, and not just zero in on the environmental problems that have already been clearly identified, but it was aimed at a base-line management report on what needed to be improved and what needed to be done. It was never intended that that was to be a driver of the award fee, but, rather, was to identify management systems and changes that needed to be put in place.

For example, as I mentioned in my testimony, that there had been an onsite staff up on the order of 17, 18 people—there might have been more—up until about 1973.

When plant operations apparently tailed off, the onsite office was disbanded, and there's been no onsite DOE representation there in the way of management staff until 1985.

So, that particular report, while it is of concern of how things needed to be improved, it was not designed to drive the award fee situation.

We did send that to NLO and asked them to start developing a plan of corrective action, recognizing that some of them would take months, weeks, and, in some cases, years to cure those problems.

If I could for just a moment talk about the award fee situation and how we got to where we were, if I could figure out how to turn this machine on. [See figure 1, p. 35.]

First of all, in our performance evaluation committees, and in this case, there are five areas: Operations, that's production, safety and environment; and, as I noted in my testimony or oral statement, there were and have been about 9 or 10 subelements in here, things like environmental protection, nuclear criticality, environment safety and so forth, budget's been another, maintenance management, instruction, and engineering.

The numbers under each heading indicate the number of people who sit on these particular performance evaluation committees. They derive their data base from appraisals that are done.

I've talked about the weaknesses that we have in our appraisal system, and we are implementing that new system. I'm not happy with it yet, because we have to shake it down just like you do when you have any new piece of equipment or system. And I have gone on record to say that I intend to invite the inspector general to come and review our new appraisal system and determine or, at least, inspect the change.

One of the things that the performance evaluation committee also derives from the assigned visits, DOE internal data systems, and they, in turn, provide their information up to the Award Fee Board. [See figure 2, p. 36.] The composition of that Award Fee Board you can read this chart for yourself. They feed the data up to these people. And the Award Fee Board then goes into the exercise of reviewing the reports that have been furnished. Each of these committees establish a report, assign a numerical rating, if you will, or grade, and that's provided to the Award Fee Board. [See figure 3, p. 37.]

This is the actual situation as it has pertained in the past with NLO. Three major areas that are set out contractually; 30 percent from management administration, 30 percent for resource management, and 40 percent for production.

The percentages here under the subcategories were assigned by the Award Fee Board.

If you would imagine an invisible set of numbers here, these were the numbers that were provided by the performance evaluation committee in their reports, and what takes place is a multiplying exercise. For example, 50 would be multiplied times whatever that number is, 60, or 80, 90, and ultimately all of these summed and multiplied against that and give you a stub over here.

The same thing takes place here. [Indicating.] The same thing takes place here. [Indicating.] And it gives you an overall total score.

And the last time that NLO was rated, they received a rating of 90.3. That was the sum of this particular exercise.

That particular 90.3 equates to a rating of excellent.

On our scale, excellent runs from 85 to 95. So, they were not at the top end of the scale.

As a result of their performance and the areas and ways in which they were graded, I think they left on the table in the past fiscal year something on the order of $400,000 or more, as I recall, or like about 24 percent of the fee they could have earned they left on the table because of the way they were evaluated.

I'm not trying to defend how we evaluate, OK. I'm just stating facts.

The difference that I mentioned, sir, that we're now going to do is that when these performance evaluation committees sit down with the Award Fee Board, they go through their reports, and the Award Fee Board comes up with these ratings, I and my deputy manager will sit down face to face with these people to make sure that these areas have been given proper reflection. [See figure 4, p. 38.]

[Figures 1–4 follow:]

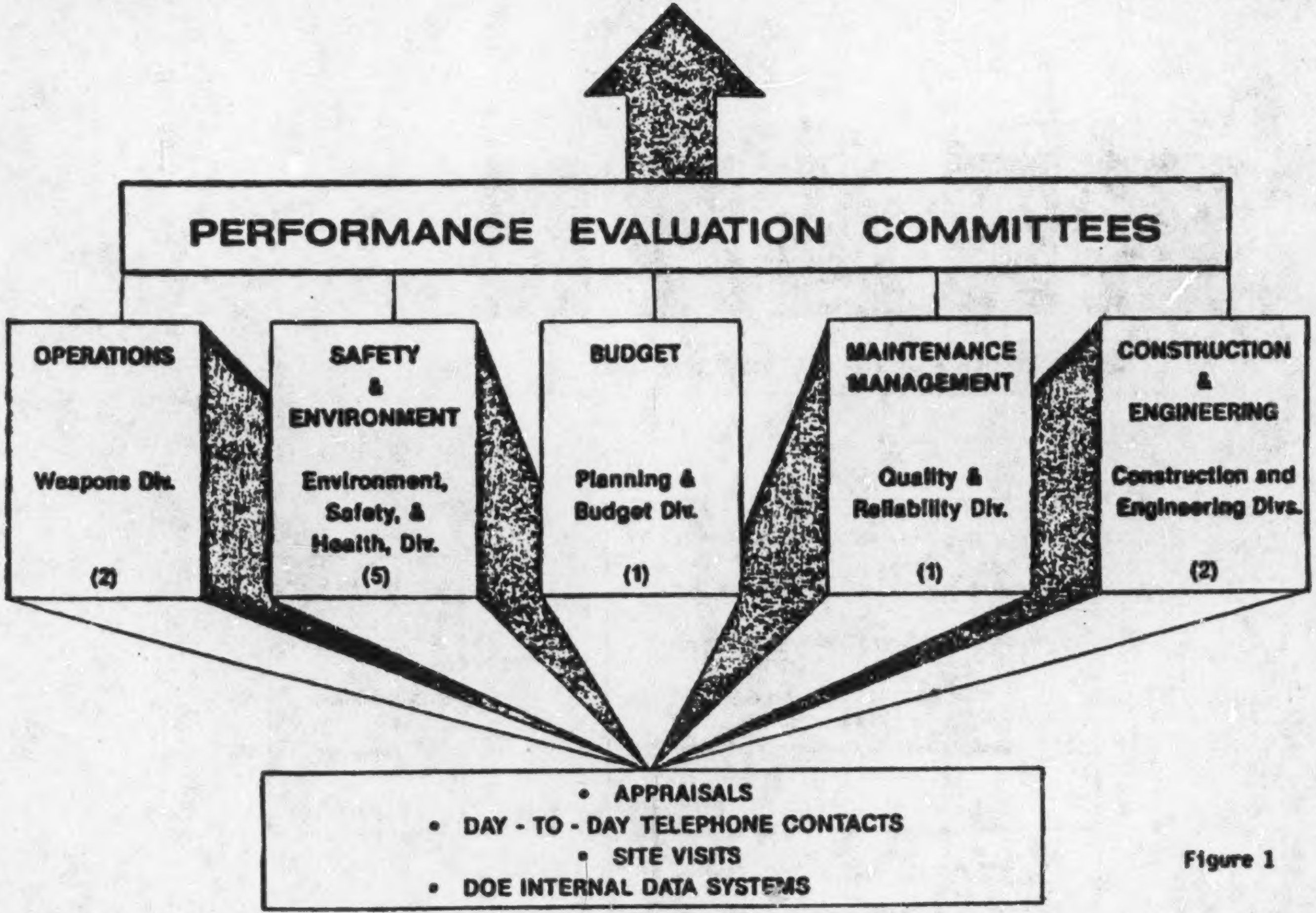
PERFORMANCE EVALUATION COMMITTEES
OPERATIONS
Weapons Div.
(2)
SAFETY & ENVIRONMENT
Environment, Safety, & Health, Div.
(5)
BUDGET
Planning & Budget Div.
(1)
MAINTENANCE MANAGEMENT
Quality & Reliability Div.
(1)
CONSTRUCTION & ENGINEERING
Construction and Engineering Divs.
(2)
• APPRAISALS
• DAY - TO - DAY TELEPHONE CONTACTS
• SITE VISITS
• DOE INTERNAL DATA SYSTEMS

Figure 1

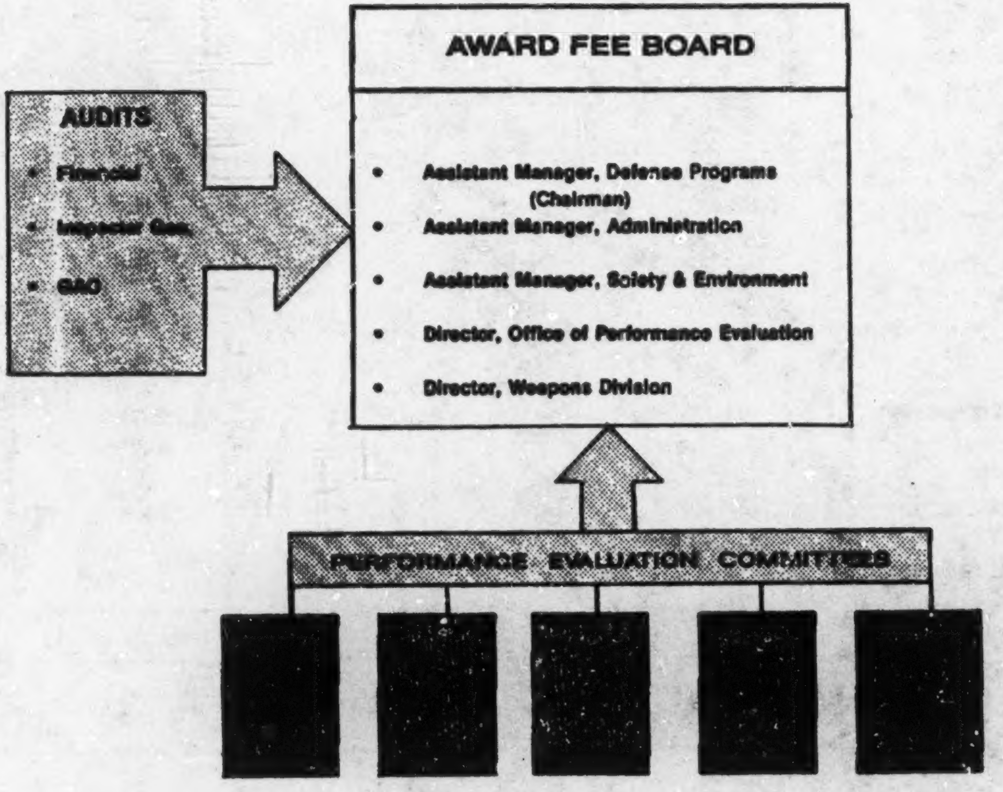
AUDITS
• Financial
• Inspector Gen.
• GAO
AWARD FEE BOARD
• Assistant Manager, Defense Programs (Chairman)
• Assistant Manager, Administration
• Assistant Manager, Safety & Environment
• Director, Office of Performance Evaluation
• Director, Weapons Division
PERFORMANCE EVALUATION COMMITTEES

Figure 2

PERFORMANCE AREAS & WEIGHTINGS

	OPERATIONS	SAFETY & ENVIRONMENT	MAINTENANCE	BUDGET	CONSTRUCTION & ENGINEERING
MANAGEMENT & ADMINISTRATION *(PEOPLE)* 30%	50%	15%	10%	15%	10%
RESOURCE MANAGEMENT *(DOLLARS)* 30%	40%	10%	15%	25%	10%
PRODUCTION *(OUTPUT)* 40%	65%	15%	20%	0%	0%

Figure 3

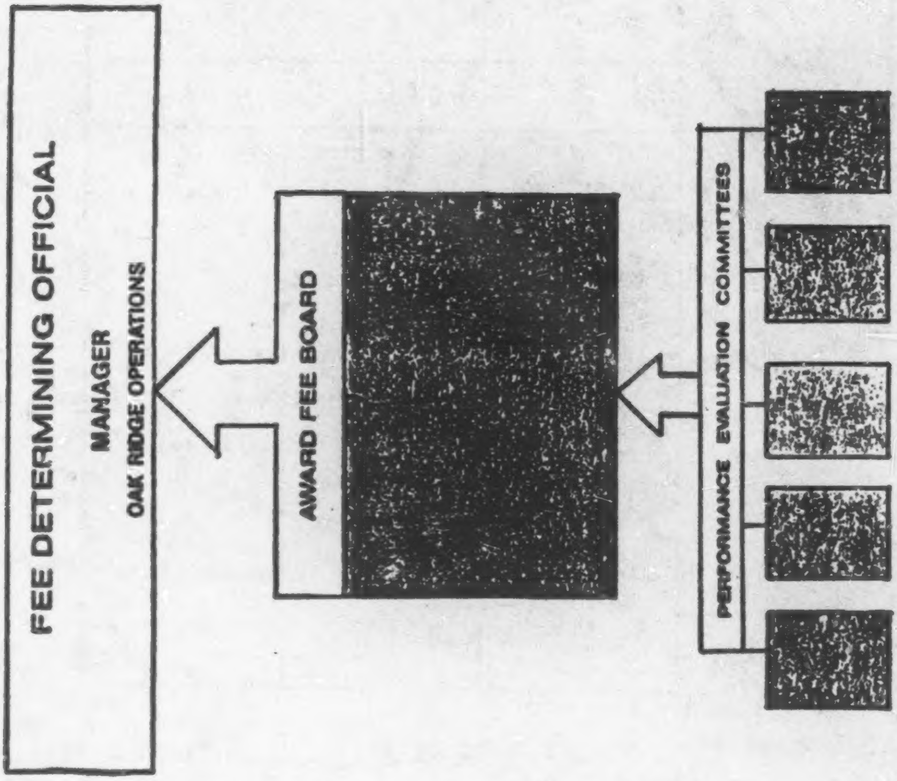
FEE DETERMINING OFFICIAL
MANAGER
OAK RIDGE OPERATIONS
AWARD FEE BOARD
PERFORMANCE EVALUATION COMMITTEES

Figure 4

Mr. **La Grone**. The second thing that I have done in the case of Fernald is to move environment out as a separate item by itself where it will receive more attention, more visibility, and more weight, and that way it will tend to offset.

And, clearly, as this has been shown time and again, and I think it was in the first article I ever read when Mr. Luken spoke to the press about Fernald, production and the need for production has driven the situation out at Fernald. It's also driven the Award Fee situation, and there's no denying that when you go back and review the numbers.

Senator **Glenn**. Well, I know we don't want to spend all day today going through the award fee system, but under the award fee guide, it says that determination of any award fee is contingent on the contractor maintaining acceptable levels of ongoing performance in all areas under the contract.

Mr. **La Grone**. Yes, sir.

Senator **Glenn**. All areas under the contract. It would seem to me that it would be pretty hard-pressed to still give a million dollar award fee under the situations which existed here, and we could spend the whole hearing just on that.

Mr. **La Grone**. I realize that.

Senator **Glenn**. I don't want to spend more time on this. I'd like to get on with a few other questions here, because our time is running here.

Mr. **La Grone**. Thank you, sir.

Senator **Glenn**. Let me change this over here just a moment.

Mr. Spenceley, isn't it true that the radiation detectors were installed just 2 years ago, is that correct?

Mr. **Spenceley**. The radiation detectors that you're referring to are a development of one of our employees at NLO to fill a gap. There is no industrial detector that we have been able to find over the years that meets our requirements.

This detector is based on a Geiger-Mueller Instrument, which is certainly not new, but the Geiger-Mueller Instrument is used to measure the amount of material—the adaptation of the Geiger-Mueller counter, in this case, is used to measure the beta plus gamma radiation on the filter media that we have on each stack. In so doing, it gives us a pre-warning of build up of material on that stack. We have those units installed on seven stacks at the present time, and have purchase orders out for 15 more to put on additional stacks.

Senator **Glenn**. Is it a radiation measure or a——

Mr. **Spenceley**. It's a radiation measure of the beta plus gamma of the material that is being collected on the pleated filter within our stack filter.

Senator **Glenn**. OK. And those type of monitors are not commercially available?

Mr. **Spenceley**. We have been trying for some 30 years to find an acceptable meter and have not been able to find one to the present time.

Senator **Glenn**. Before that, was there any way of telling when you were having trouble with the bag-house?

Mr. **Spenceley**. There is a differential pressure unit on each one of the collectors. Essentially, this measures the catastrophic failure.

If you have a tear of a bag, a drop of a bag from—a major change in the filtration area of it, the differential pressure unit would measure on the low side, and this is checked on an hourly basis.

Other than that, we use visual inspection. Prior to this instance, our visual inspection was one visual inspection per operating day. We inspect the filters by the health and safety department on a frequency of once a month. In view of the problems that we experienced in the November-December area, we have changed the frequency to where we are inspecting visually the collector.

Senator **Glenn**. We were told, too, that when you started having some problems in the bag-house with this type of monitoring system that it became rather common practice just to turn the sensitivity down so it wouldn't show the problem, is that correct?

Mr. **Spenceley**. We acknowledge that the sensitivity was turned down, but it was not for the purpose that you indicated.

Again, the Geiger-Mueller Instrument mentions the beta plus gamma radiation, and normal uranium, pure uranium is an alpha emitter, so that the instrument is more effective in those operations starting with the remelt operation or the recast operation and moving down, so there is an increase in the beta-gamma radiation in those instruments.

But since there is no standard beta-gamma radiation for a given quantity of uranium, we have to calibrate every instrument in each one of those locations.

The problem in this case was that while the instrument was sounding an alarm, repeated visual inspections to that collector had not corroborated what the instrument was telling us. And, so there was an erroneous conclusion drawn that the calibration of the instrument was wrong, and that was the purpose of changing the sensitivity, not to keep it from buzzing in people's ears. In fact, one of the recommendations is that we relocate this alarm because it's in a location that cannot be heard readily.

Senator **Glenn**. On October 25, 1984, just last fall, you received a semiannual appraisal of NLO safety environmental program from DOE, covering the period, April 1 to September 30, 1984. Some of the things the report said weren't very complimentary.

They said, No. 1, the environmental monitoring report of fiscal 1983 was issued 3 months late.

Two, deficiencies in the PCB program were corrected only after an inspection by State representatives.

Three, the hazardous waste management program has numerous inadequacies, as indicated by an inspection by the State and the DOE.

Four, the hazardous waste management program is not in compliance with DOE orders, indicated such events as unknowingly accepting various hazardous waste from other facilities, and the improper storing of hazardous waste in the old incinerator.

Five, management of contaminated scrap metals and other waste needs to be improved.

Six, controls on management of these wastes during storage, transport and final disposal needs to be improved.

Seven, staffing and training our inadequate to meet the requirements of the various environmental laws in which NLO operations must comply.

Can you tell us what rating NLO received from DOE on its environmental program during this period?

I think I can provide the answer for you. As understand it, it was considered to be "satisfactory", and the overall rating was "excellent" during that period.

Mr. SPENCELEY. I think that is correct, sir.

Senator GLENN. Well, that gets back to my question to Mr. La Grone a few minutes here about how we're going—I hope we're going to make this system mean a little bit more now than it has in the past.

Mr. LA GRONE. Senator, you have my personal assurance and promise that it will be.

Senator GLENN. Mr. Spenceley, why did NLO want to return to a cost-plus fixed fee contract after the releases were made public in 1984? Did you doubt whether you had done the proper job out there, proper enough to be judged on performance alone?

Mr. SPENCELEY. I really can't comment on that since that request came from our parent company.

Senator GLENN. Did NLO ever specifically request funds from DOE to comply with environmental standards along with a specific listing of what was needed?

Mr. SPENCELEY. Yes, we did. Three major projects that come to mind are, No. 1, the HEPA filter installations. We began contemplating HEPA filters in 1982, and had HEPA filters included in the fiscal year 1986 budget, which was prepared in January 1984, I believe.

We have water pollution control, which was a 4 or 5 faceted improvement program to allow us to meet the specifications for nitrates in our discharge, as well as taking care of the acidity coming from coal pile run-off, from decontamination of our sewer operations, and provision of a storm sewer retention basin, so that we no longer have to discharge overflows to Paddy's Run.

That funding was asked for in time to meet a change in the NPDES in June 1984. The funding was not available, and we will not be in compliance, and this project will not be complete until the summer of 1986.

Senator GLENN. Mr. Chairman, you're being very gracious here in allowing me to continue here beyond our usual committee 10 minutes, and I just have a couple more comments before we get on with Congressman Luken's questions here. I know we do have to hurry along.

Let me ask this, if I might, in the task force report, it said that the inadequate hazardous waste management at Fernald was a result of an NLO misunderstanding; that DOE operations were exempt from EPA and the State enforcement of hazardous waste regulations. Consequently, NLO felt that it was not necessary to have an EPA equivalent program unless DOE specifically directed that they do so since DOE was considered the only enforcement authority.

Does that mean that DOE never told NLO what its hazardous waste management responsibilities were, and that NLO never made any attempt to find out precisely what regulations it was responsible for meeting?

Mr. **Spenceley**. The only problem that we had in that area was the problem of whether or not DOE sites were to be responsive to the Resources Conservation Recovery Act, RCRA. That has still not been reconciled in court, to the best of my knowledge on it.

Senator **Glenn**. What's the status of that, Mr. La Grone, do you know?

Mr. **La Grone**. Sir, I would defer to Mr. Cochran in the Washington office, and the Washington level has been discussing this with EPA, if I may.

Senator **Glenn**. Is that still in the courts as Mr. Spenceley said, or what's the due date out of court, or do we know?

Mr. **Cochran**. There was a court case in east Tennessee as you may be aware. As a result of that court case, DOE hazardous waste is clearly under the Resource Conservation and Recovery Act regulated by EPA.

There are still some issues to be resolved with regard to mixed waste, and that is the point which I covered in my testimony. The areas to be resolved there really have to do with working out appropriate ways with EPA to handle the mixed waste streams so that national security is protected appropriately. This is not intended to get around the requirements. Even in those areas where DOE remains in charge, we will meet the same kind of requirements. Where the requirements are not specified, we will work as hard as we can to develop requirements comparable to EPA's requirements and meet those.

Senator **Glenn**. OK. Only one other question, Mr. Spenceley, and that is I know you have not—NLO has not applied to renew the contract, and it is up, as Mr. La Grone said, for consideration. It will be done by what did you say, July 8, I believe?

Mr. **La Grone**. The proposals are due in by July 8.

Senator **Glenn**. When will a decision be made?

Mr. **La Grone**. I would expect the source selection official will make a decision within 30 to 45 days after he receives the Source Evaluation Committee's report. The source selection official is the Deputy Assistant Secretary for Defense Programs in Washington, sir.

Senator **Glenn**. I would hope that that would be done expeditiously and we would be prepared to make an immediate decision on that, so that this doesn't hang fire, and we wind up with a lack of management onsite here that is going to be responsible for the years ahead. So, I would hope that that would be a very fast decision once those proposals are in.

Mr. **La Grone**. That is our fondest hope.

Senator **Glenn**. And I would also hope—I know sometimes when offices get turned over and contractors are turned over one to the other, sometimes there's sort of a sweep-out of all the records and things like that, for whatever reason. I would hope that all the records out here, including all the health records of individuals who have been employed out here, are absolutely, unequivocally not messed with, tampered with, they're not destroyed, that they are turned over to either your authority or to the new contractor, whoever it is, so that we don't wind up 10 or 15 years from now finding that, yes, there's a problem, but we don't have the health records, we don't have the employment records, we don't have the whatever of people that have worked here over the last 30 years.

And I hope that all those records—and, Mr. Spenceley, hope it's your intention, and NLO's intention, to turn over records in "toto," complete; nothing sanitized for individuals, companies, or DOE, or anybody else, as to what may be in the files, so that we don't wind up one of these days with inadequate records on which to base future possible legislative action. Who knows what may come out?

Mr. **Spenceley**. I can unequivocally tell you that we will turn over every record that is currently in our possession out there, "in toto."

Senator **Glenn**. Well, I'm glad to have your personal assurance on that, and I know Mr. La Grone will be looking at that also, and I think that's only fair for the new contractor, but, more than anything else, it's only fair for those who have worked there, and have been involved there, and community concerns nearby, that we have every bit of information kept that is available.

Mr. **La Grone**. We're in complete agreement.

Senator **Glenn**. Thank you for your forbearance, Mr. Chairman.

Senator **Cochran**. Thank you, Senator.

Mr. Congressman, if you have any questions of any of the members of this panel, please feel free to direct them to the members.

Congressman **Luken**. Thank you, Mr. Chairman.

As you may imagine, I am somewhat wrapped up in this, and I will take advantage of the committee's time to probe or, at least, to inquire about some areas that I'm very concerned about, and I think the Senators have already covered much of that, and covered it very well.

Mr. La Grone and Mr. Cochran, either one, are we agreed that radionuclides, radioactive emissions, are hazardous?

Mr. **Cochran**. Sir, it depends on the level. There is some radioactivity in most soil. It is low enough——

Congressman **Luken**. No, emissions, I'm talking about.

Mr. **Cochran**. I am sorry, OK. There is some radioactivity there. Emissions, I would——

Congressman **Luken**. Are you concerned about radioactive emissions in your facility?

Mr. **Cochran**. Absolutely, sir.

Congressman **Luken**. It's one of the high priorities, I assume.

Mr. **Cochran**. It is one of the highest priorities.

Congressman **Luken**. And are you aware that EPA has rated Fernald as the highest radioactive emitter in the country, in the whole spectrum of the DOE operations that this is the highest emitter of radionuclides? Are you aware of that?

Mr. **Cochran**. Sir, EPA is starting to look at a number of these areas where they do indicate that we have high emissions. We intend to take steps to correct that. We have two problems.

Congressman **Luken**. Sir, I don't think you answered my question. Are you aware that EPA has specifically rated Fernald as the highest emitter, the worst offender in this area, in the country?

Mr. **Cochran**. I am personally not aware of that.

Congressman **Luken**. Mr. La Grone.

Mr. **La Grone**. I have heard that, sir. And if I might, at this moment, ask Mr. Reafsnyder, if you would give him just a couple of minutes to talk about some of the things we're trying to do on stack emission controls.

Congressman LUKEN. No, I'm not interested in some of the things you are trying to do.

Mr. LA GRONE. All right, sir.

Congressman LUKEN. And you have taken a lot of time previously in answering other questions, I have noticed.

This is a very specific question, very pertinent, right to the core of the matter, and I've asked it three times and I can't get an answer from either one of you.

Mr. LA GRONE. Sir, I have heard that. I don't know that for a fact.

Congressman LUKEN. You mean that you don't even know, Mr. La Grone? You don't have any idea? You come in here and say that you have reformed, and that you don't really know where Fernald rates in the degree of emitting radionuclides?

Mr. LA GRONE. I have not seen such a list, sir, no, sir

Congressman LUKEN. And you don't know of your own knowledge, or you don't know of the combined knowledge, you've come in here, Department of Energy at a Senatorial inquiry, and you don't have any idea of where it rates, what the degree of emissions into the atmosphere in this community, you don't know what that degree of emissions is compared to others?

Mr. LA GRONE. As a comparison to other facilities that handle and process uranium and radioactive materials, I do not know that, sir.

Congressman LUKEN. Well, that scares me. Do you have any idea, if not comparative, as to what the emissions are? Do you think they've been serious here?

Mr. LA GRONE. Absolutely. I think they've been very serious.

Congressman LUKEN. Well, I'm not going to pursue the matter any more, because I think it's been pretty well handled as to the ratings and how they've been arrived at, but I would comment that according to your system of evaluation, it would be possible for Union Carbide to get an "E" for excellence in Bhopal, India, as long as they provided the production and the budgetary considerations for management. Do you have any comment on that?

Mr. LA GRONE. I would have no comment on it, sir.

Congressman LUKEN. All right. Let's go to another area. And, again, I address it to either one of you. If there were uranium in the well at your home, which you use for drinking water, would you be concerned?

Mr. LA GRONE. I would be, yes, sir.

Congressman LUKEN. Then if you would be concerned about it, you would also think you would be entitled to know whether that uranium was enriched or not?

Mr. LA GRONE. Yes, sir.

Congressman LUKEN. And, yet, you state in this—and I realize we're going back over some—well, not too ancient history—you state in—this isn't ancient history, because the well water issue began in 1982 when it came to the fore, and you state that the well owners in this area were specifically advised that there was uranium in their wells, but they were not advised that it was enriched. Now, specifically then, DOE, and that's the reason why I have characterized it as deceit, because this has to be intentional, withholding that information, does it not?

Mr. LA GRONE. I talked with the gentleman who wrote that particular section of the report, Mr. Luken, and he advised me that his intent, and including that statement, that, however, the homeowners have not been informed that it is slightly enriched—I believe that's the expression he used—that he included that to clearly delineate that it was our material or material that had migrated from the DOE operations. He said he had looked at earlier correspondence that had gone to homeowners and thought it could have been made stronger and more clear that it was our material, and that's why he put that in there.

There was never any intention, sir, on my part, his, or anyone else's in our office to deceive anyone on that point.

Congressman LUKEN. I submit that that might be characterized as bureaucratese on his part, but it's a very simple matter to most people. It was enriched uranium, and you felt some obligation; that is, the Department did in notifying the owners. And the fact that they were not notified that it was enriched, it's just beyond description. In my opinion, it can't be satisfied with that.

Mr. LA GRONE. I asked him the question about the slightly enriched, and the point there was, he did consider at that level of enrichment, which was about .07475, it was not considered to be a health problem.

Congressman LUKEN. I know, but that is not the point. It isn't the point as to whether or not it is a health problem, but it is a point that you are now saying that you are approaching this with complete candor, and that is refreshing. And I might say it's a switch, because, here, the only difference, if it isn't a health problem, and withholding that information is to obscure the issue to the public around here, to the people around there, obscure the obvious fact that the source of this uranium wasn't the ground or anything like that but was Fernald FMPC. That's the problem.

It was the lack of candor, and the lack of candor that has existed, and I think we have to test that now as to whether we are, in fact, going to experience candor.

And on that subject of candor, Mr. Cochran, you have just said that, in general, we must meet the same or more stringent requirements as the private sector. I have a hard time accepting that. It seems to me that the rules and the regulations have exempted DOE, and that DOE has taken advantage of every one of them, gone to court, and has, in general, attempted to exempt itself from the rules and regulations that apply to private contractors. Isn't that right?

Mr. COCHRAN. What I have said that we will do is meet the same set of requirements. Many of the——

Congressman LUKEN. You are saying that?

Mr. COCHRAN. Yes, sir.

Congressman LUKEN. You're not going to assert the legal exemptions that are in the law that, for example, gives the DOE the right, as you say, to set its own standards for uranium in water? Are you going to assert that or are you going to accept EPA standards?

Mr. **Cochran**. Where other standards have been adopted by the Nation, we generally accept those standards also.

Congressman **Luken**. Could we get around to the specifics? Are you going to accept the EPA standards for uranium in water, in drinking water?

Mr. **Cochran**. Those have not been established yet. There is no way that I can tell you for certain that we will, but I would expect that we would, sir. I have not seen that.

Congressman **Luken**. But it would be voluntary, right? But if it was Procter & Gamble, or General Electric, or, you know, just talk about some of the strong citizens out there, it wouldn't be voluntary? They would be required to accept them, wouldn't they?

Mr. **Cochran**. There are regulatory bodies that would require that. There are regulatory bodies that require us to accept certain public standards. There are some areas where we have our own regulatory apparatus.

Again, we are not trying to meet any different requirements. It's a question of how one goes about it.

Congressman **Luken**. Well, what about compliance with RCRA? You have clocked that even as to hazardous materials, did you not, DOE?

Mr. **Cochran**. Sir, we needed a definition——

Congressman **Luken**. Is there a yes or no answer to that? Didn't you fight——

Mr. **Cochran**. We did not fight meeting the requirements, sir.

Congressman **Luken**. What?

Mr. **Cochran**. We did not fight meeting the requirements.

Congressman **Luken**. Did you get into a court action on that?

Mr. **Cochran**. Yes, sir. That's the one I referred to——

Congressman **Luken**. Oh, you didn't fight it. You just went to court over it?

Mr. **Cochran**. We went to court to get clarification of where it applied. In our particular case, there are certain areas under the Atomic Energy Act where RCRA does not apply. RCRA was prepared primarily to deal with hazardous chemicals, not radioactive chemicals. We needed clarification for our own use, as well as EPA, of what areas should rightfully fall under EPA regulation. That was done, by and large, in the court case. That was where a decision was clarified that our nonradioactive hazardous waste does now come under RCRA.

Congressman **Luken**. Well, that may be, but let me just submit that if you were following the principle that you stated in the body of your statement here, which you submitted and read from, that you must meet more stringent requirements as the private sector, you need not have gone to court. You would have just complied with EPA standards.

Now, I'm only on the subject of candor now. It may be that since you are in the defense business, it may be atomic energy matters are such that there may be some exemptions that are, and should be, remain in place, but we're going to have to address those, and we can't address those if you're going to take the position, on the one hand, that you're willing to comply; on the other hand, that you're going to court to prevent enforcement.

Mr. Cochran. We are——

Congressman **Luken**. You know, Senator Cochran also made a, I think, pertinent observation, that there are pits out there with uncharacterized waste. I assume if there's seven pits there's, what, hundreds of thousands of tons. Does anybody have any idea? We're talking about a large amount, are we not?

Mr. **La Grone**. Yes, sir.

Mr. **Cochran**. Yes, sir.

Congressman **Luken**. That might be correct what I just said, hundreds of thousands of tons of uncharacterized waste.

Mr. **La Grone**. I think that's a fair statement.

Congressman **Luken**. And we've known, and you've known, that they're there for a long, long time, many years. They've accumulated over a period of years, and they remain uncharacterized. Now, that doesn't suggest vigilance to me. That suggests that your environmental efforts are running at a snail's pace; that there's generally inactivity; and that your poor to satisfactory ratings are well-deserved, and have been, and that this represents a clear and present danger to the public in this area.

I would be glad to give you the opportunity to comment on that.

Mr. **La Grone**. We have had the Oak Ridge National Laboratory in. Mr. Boback can comment on it, if he chooses to, or if you would let him. Looking initially at these pits, we do fully intend to completely characterize those pits on an accelerated schedule so that we know what it is there, and then from that develop plans on what to do with the stuff.

Congressman **Luken**. All right. In the area of proving performance, I notice, Mr. La Grone, in your report today and your statement today that when you took over back in 1983—that's right?

Mr. **La Grone**. Yes, sir.

Congressman **Luken**. And you assessed the problem, and you began to do something about improving the environmental measures, and the first thing you did was to establish the Y-12 plant mission on mercury, is that right?

Mr. **La Grone**. That's about the first thing that happened, yes, sir.

Congressman **Luken**. And at that time you said that you were going to get around to Fernald and such matters later. That's what you said, didn't you?

Mr. **La Grone**. I said we would get to other plants as we could get the problems under control.

Congressman **Luken**. It took you a whole year to begin to assess the situation at Fernald. It took you a whole year to begin to assess it. And I'm just stating this as perhaps not the degree of viligance, of assiduousness of approaching it, that we might consider it to be commensurate with the problems, especially if Fernald is the No. 1 emitter in the Nation. Why take a year to even begin to assess this the situation?

Mr. **La Grone**. Sir, we had tremendous resources tied down at Oak Ridge trying to get the problems under control at Y-12, and the Oak Ridge Laboratory, and those are still probably the largest single environmental problems that we have. I was also, in the middle of 1983, given responsibility for reforming the whole strategic petroleum reserve.

Congressman **Luken**. That's what's bothering me.

Mr. La Grone. That's what I'm saying——

Congressman Luken. I have respect for you that you're a very good administrator and effective person from my experience in dealing with you, but you've got too many other things to do, to do what's necessary here. How are we going to get around that?

Mr. La Grone. We are getting to them now, sir. And would also go on the record to say that we have studies underway in other plants now, and we're knocking them off as far as possibly can. And, yes, sir, the plate is full. It has been full.

Congressman Luken. All right. During the 1970's consideration was given to closing Fernald, so capital capital improvements and staffing were minimized. That's steady improvements generally, but if I could go on down—I don't have to—and read it further, your report, you say that in 1980–81 there was a reversal and capital improvements were put in for production, but nor—or I'll ask the question. But not for environmental matters, is that right?

Mr. Cochran. Sir, most of those capital improvements did, in fact, address safety and environmental matters, as well as production. In fact, I think if you will take a look at the major projects that are underway, most of them are directed either directly towards protecting the environment or toward improving the environment safety and health area, along with production.

Congressman Luken. $350 million, I believe, Mr. Spenceley said. How much of that has been expended, Mr. Spenceley?

Mr. Spenceley. I think we have some $70 million spent or authorized to spend at the present time.

Congressman Luken. Well, authorized is a little different. How much do you think has been spent? $350 million was the figure in 1982. Have you spent $30 million yet?

Mr. Spenceley. I'm sorry, I can't answer that question. I don't know the total.

Congressman Luken. So, maybe not even 10-percent of it has been spent. Should we be satisfied with that? In other words, spent, those are improvements that are still not in essay?

Mr. Cochran. You should not be satisfied, and neither are we. We are trying to move forward and accelerate that area.

In fact, in 1985, the current year, we have about $75 million of funding going into Fernald; about $20 million of that is related to safety, health and environmental matters. That increases somewhat in 1986 in accordance with the budget that's before Congress at the present time.

Congressman Luken. Well, let's look at the degree of the problem that we have in that area. In your own report, your own report, when you talk about probable causes—I believe this is the DOE report, DOE investigation report—probable causes for the leakage, the particular incident—and I agree with you that this incident, it was not so dramatic or so unusual, but it has served a very important purpose to bring other things to light here.

You say that this appears to be due in part to the difficulties encountered in operating a tightly budgeted uranium production plant with emissions control equipment which borders upon obsolescence. If we've got a plant there that borders upon obsolescence, which is emitting radionuclides, the largest amount in the country, and which has become a nuclear waste dump, where we get waste in from the Manhattan Project, where we get waste in from Missouri, and from other plants, we've got a major problem. And I just wish you could see and feel the urgency in tackling this and in appropriating the necessary funds.

Mr. **Cochran**. We feel that urgency, sir. We are going to need the help of Congress and others involved to do that, but we are committed to correcting the problems of the past to bring the plant into an operating mode which is consistent with current requirements and doing the right things here.

Congressman **Luken**. It will take 8 years, according to the schedule we've been given, to get the HEPA filters installed?

Mr. **Spenceley**. It will take some 8 years, or slightly less, to install the total number of HEPA filters. We hope to have a HEPA——

Congressman **Luken**. Could that be accelerated?

Mr. **Spenceley**. We are working on accelerating that. I would say that more nearly 4 years would be the appropriate time at the present time. We intend to have a HEPA filter installed on the plant 9 collector this July.

Congressman **Luken**. Well, it sounds like business as usual. It may take 8 years or it may take 4 years. It doesn't seem that we really know, and so suspect that the 8 years is more likely.

Well, I have imposed upon the committee's time, I think, to the extent that it's been outlined, and tried to generally indicate to you my concerns, and I especially appreciate the responses that were received from the Department and the contractor. Especially I thank Senator Cochran and Senator Glenn for the opportunity to participate.

Thank you, Mr. Chairman.

Senator **Cochran**. Thank you, Congressman.

I have one final question. I'm aware of the fact that there is a competitive bidding underway now, as I understand it, for the operation of this plant. Now, do you feel comfortable in the notion that you will be able to attract a competent operator for this facility? I'm concerned in one respect, and that is that National Lead of Ohio has chosen not to participate in the bidding, is that correct?

Mr. **Spenceley**. That is correct.

Senator **Cochran**. What evidence do you have that you will be able to find a competent operator of this facility who will be able to operate it with a sensitivity to the environmental issues and concerns of this community?

Mr. **La Grone**. Sir, I have had contacts from several organizations who have expressed more than a casual interest, have stated their plans to bid. I've had some contacts that says "We're giving it serious consideration", and those kinds of things. We do believe we will get some responsible companies to bid this job.

Senator **Cochran**. I don't know whether you're prepared to answer this or not, but why are you not participating in the competitive bidding?

Mr. **Spenceley**. This is a decision made at the corporate level; however, NL Industries is no longer engaged in heavy metals, heavy chemical works, as we were back in the early 1950's when we first bid for this contract. We can no longer supply the expertise from the parent company that is required.

Senator **Cochran**. Well, I appreciate very much the cooperation of the witnesses.

Senator Glenn, do you have any other questions of this panel?

Senator **Glenn**. No, I have nothing else. I appreciate all the testimony this morning. And I would just repeat what I said when we started out here this morning, and I know the questions have been very direct here this morning, and I appreciate your answers. Some of them are embarrassing; some not embarrassing; some show that we should have been on a lot of these things a lot earlier. Hindsight is always good.

But the main thing now is to do something to clean up and get going, and that's what we want. We've drug our feet too blooming long. And my view is that we have to get going on this, clean the thing up. We need the plant for national security purposes, as I've said earlier. Everybody knows that and knows the key role it plays in that, but it can't be at the expense of the health of workers or those in the surrounding communities, and that's what we want to get cleaned up.

If you need help at our Washington end for whatever there is in legislative requirements or funding requirements, I implore you, please be in touch with us there. We will do everything we can humanly do to make sure that we take the action that is necessary to get things cleaned up.

I have taken the actions and initiatives that I've indicated earlier on a couple of pieces of legislation already, and we plan to follow up on this when we get back, because we think that would be a better checking system on this. I know we all don't agree on that, from your standpoint, but we think having a cross-check with other agencies involved is also a good idea, so we will be following up on that.

But if there is anything we can do from a legislative standpoint on Capitol Hill, please be in touch with us.

Senator **Cochran**. We appreciate the attendance and cooperation of this panel. You may now be excused and step down from the witness stand.

[The prepared statements of Messrs. Cochran (with attachments), La Grone, Spenceley (with attachments and a supplemental statement), and responses to written questions by the Department of Energy and NLO, Inc., follow:]

PREPARED STATEMENT OF RONALD W. COCHRAN

Mr. Chairman and Members of the Committees, I am pleased to have the opportunity to appear before you today to discuss the management of health and safety at Department of Energy (DOE) facilities, concentrating on the Feed Materials Production Center (FMPC) at Fernald, Ohio, as an example.

Secretary Herrington is personally dedicated to protecting the health and safety of our workers and the public. He is committed to further improvement in our practices and is committed to taking all reasonable actions to correct problems which are found to exist at DOE facilities. You may be assured of his support in working to correct any deficiencies involved in health and safety policies or practices.

Emission of uranium dust from the FMPC to the air late in 1984 and emission of much larger amounts to both the air and nearby streams during more than 30 years of plant operations has focused congressional and public attention on the adequacy of the Department's management policies and practices in the vital area of health and safety. This is a matter of sincere concern to the Department. At the time of the releases last autumn, the Department already had reviews underway to identify actions which would be needed to upgrade our equipment and activities at FMPC to reduce emissions and irradiation exposures to "as low as reasonably achievable" as required by our DOE Orders. These overall studies have been expanded and intensified since that time.

Protecting the health and safety has been one of our highest priority objectives since inception of nuclear programs more than 40 years ago. This emphasis has produced a health and safety record for our employees which is unequalled in any other comparable industry. The Department's injury and illness rates for FY 1984 were well below the national average.

Although this overall record is outstanding, it is not enough. New problems develop, other problems are discovered, and some simply accumulate until they assume major significance. We are dedicated to doing better in those areas where problems have been found to exist.

In addition to supporting the investigation activities which will be summarized for you during this hearing, the Secretary sent his own team of senior DOE officials to the FMPC site to review the situation concerning the problems and issues which had been identified, as well as the overall status of completed or planned corrective actions.

Importance of Feed Materials Production Center

The FMPC is important to this Nation. It is a unique national asset unmatched in its full range of capabilities and capacity by any other facility in this country. It produces uranium fuel and other uranium reactor core materials to support operation of this Nation's production reactors. Those reactors produce nuclear materials for defense, nondefense research and development, and private sector applications. Nuclear materials from these reactors are essential to modernization of our nuclear weapons and maintenance of our nuclear deterrent capability to ensure peace. Materials from these reactors provide vital medical therapy applications, power sources for many of our major satellite space missions, smoke detectors for our homes, and radiation sources used for the preservation of food.

On a more local level, the FMPC provides employment for well over 1,000 people from this area. It provides a payroll in excess of $40 million a year into the economy of this area.

Nevertheless, we will not operate this plant unless it is safe and the necessary repairs have been made.

The nuclear materials production facilities supported by FMPC have a replacement value of approximately $16 billion. Over 26,000 Federal and private sector employees are involved in managing and operating the nuclear materials program activities. For the current fiscal year, Congress appropriated $2.48 billion for this program of which 11 percent, or $260 million, is for activities aimed at protecting the health and safety of the public and our workers, as well as providing acceptable protection to our environment. In carrying out these activities, we cannot compromise on health or safety or adequate protection of our environment.

I will now address the various issues concerning DOE's overall health and safety policies and performance identified by the Committee in Senator Glenn's letter. In addition, I will discuss the actions that the Department is taking at our sites, and especially our nuclear materials and weapons production sites, to protect the health and safety of our employees and the public, as well as the environment. Joe La Grone, Manager of the Department's Oak Ridge Operations Office (OR), who has direct responsibility for managing the FMPC, will then address those issues of interest to the Committee associated with this particular site.

OR is responsible for managing all aspects of the activities at FMPC under the general direction of the Assistant Secretary for Defense Programs at DOE Headquarters. Joe La Grone will discuss how the operations office carries out this task and interfaces with the operating contractor, NLO, Inc. (NLO).

As I previously stated, the Department's overall health and safety record has been outstanding. Its overall environmental record has also been good. However, keeping pace with the increasingly complex and dynamic situation regarding environmental regulations continues to be a challenge. In general, we must meet the same or more stringent requirements as the private sector. This has required DOE to reevaluate previously accepted practices and place a much higher priority on environmental issues. There are problems in this area which need prompt attention. We will work with State and local officials, other Federal agencies, and the Congress to correct problem areas and prevent their recurrence.

Response to Specific Issues

I will now respond to the specific issues identified by the Committee related to overall DOE policy and performance.

Relative to your question on DOE policy concerning radiation monitoring and informing DOE workers and the public adjacent to DOE sites, DOE Order 5480.1A, Chapter XI, requires that radiation monitoring be performed to assure that exposure of workers and members of the public is maintained within DOE radiation standards and is as low as reasonably achievable. For workers, monitoring includes workplace and personal monitoring. For the public, monitoring includes emission and environmental monitoring.

DOE Order 5484.1 requires that employees be informed within 24 hours of any radiation overexposure and furnished a summary of their exposures within 30 days of submitting a written request. DOE Order 5483.1A requires that contractor employees (or authorized representatives) at DOE's Government-owned, contractor-operated facilities be provided with an opportunity to observe monitoring or measuring for toxic materials and harmful physical agents and have access to the results. This Order also requires that each employee, former employee, or employee representative within 15 days of a written request, shall be provided access to or copies of any records of cumulative recorded occupational radiation dose or any monitoring or bioassay records relevant to potential exposures during employment. Employees must also be notified of any information which would indicate that an overexposure had occurred.

DOE Order 5484.1 requires that each nuclear installation prepare an annual environmental report in which radioactive emissions, environmental monitoring data, and calculated doses to members of the public are summarized. In addition, the reports must include discussions on accidents, including unplanned releases of pollutants, and a summary of compliance with Federal and State laws, regulations, and permits. The reports are, and have been, widely distributed to State and local officials and to interested organizations and individuals.

The above requirements on radiation monitoring and access to monitoring data were also requirements of the Atomic Energy Commission and the Energy Research and Development Administration, the predecessor agencies of the Department. There are 12 DOE nuclear facilities (sites) at which major nuclear weapons production or material production is conducted. In 1983, the most recent year for which data are available on public doses, the highest calculated whole body annual dose to the maximally exposed individual near any of these facilities was 34 mrem (Los Alamos National Laboratory). At most of the 12 facilities, the whole body dose to the maximally exposed individual was less than 1 mrem in 1983. The current DOE standards for public exposure were 500 mrem/year to the whole body and 1500 mrem/year to organs. These standards are based on the Federal Radiation Council recommendations and were implemented by Presidential directive in 1960.

With regard to your question concerning a comparison of radiation risks to the public from DOE nuclear facilities and also from past nuclear weapons tests, the cumulative population dose to a distance of 80 kilometers from all 12 facilities was less than 300 person rem in 1983. This compares with a cumulative dose for the same individuals from natural background of greater than 2 million person rem. DOE facilities contributed an average 0.015 percent increase in the radiation exposure received from natural background.

The radiation doses from natural sources remain rather constant from year to year and range from about 80 to 170 mrem per year depending on location in the United States. For comparative purposes, information on population doses from worldwide fallout produced by nuclear weapons tests is summarized from a 1982 report of the United Nations Scientific Commission on the Effects of Atomic Radiation. This report, "Ionizing Radiation: Sources and Effects," estimates that the worldwide average annual effective whole body dose from fallout radionuclides is presently less than 2 mrem. Most of this dose comes from Cesium-137 deposited on the ground (external radiation) and distributed in various body tissues and Strontium-90 in bone. The external radiation and ingested radionuclide dose is negligible. Radiation dose from atmospheric weapons testing is decreasing each year.

With regard to National Institute for Occupational Safety and Health (NIOSH) access to DOE facilities and worker health records, DOE's policy is set forth in a March 28, 1985, letter to Senator Glenn which is attached for the record. As indicated in the letter, DOE has completed the necessary Privacy

Act procedures to provide NIOSH access to records at the FMPC and is continuing the previously granted access to medical records at the Portsmouth facility. Although DOE had proposed, during the Privacy Act process for the FMPC records, to include access to records at all DOE facilities, many comments were received from physicians opposing such a blanket release of medical records. For this reason, the Department concluded that the proposed use of such data should be tailored more carefully to those instances where there was a clear and demonstrated need. We will continue to work closely with NIOSH to assure that it receives the data necessary for it to carry out its responsibilities.

In your letter of invitation, you requested DOE's position on legislation to transfer the management of epidemiological research to the Department of Health and Human Services. The Department strongly opposes that legislation because it would not improve the quality, objectivity, or reliability of this research and would require duplicative efforts in both Departments. A letter outlining our views to S.525 is attached to my testimony.

With regard to our position on legislation to transfer the regulation of mixed waste at DOE facilities to the EPA, we are working with EPA to define a reasonable division of authority for the regulation of this material. The Resource Conservation Recovery Act (RCRA), Section 1004 (27), defines the term "solid waste" as not including "source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954, as amended (68 Stat. 923)."

RCRA Section 1006 (a), pertaining to application of the Act, provides that nothing in RCRA shall be construed to apply to (or to authorize any State to regulate) any activity or substance that is subject to the Atomic Energy Act, "except to the extent that such application (or regulation) is not inconsistent with the requirements of (the AEA)."

DOE and EPA have been attempting to define the jurisdictional implications of the Act. As you may know, jurisdiction of RCRA over DOE nuclear facilities and activities was the subject of litigation in the Eastern District Court of

Tennessee. Subsequent to that lawsuit, EPA and DOE have been working to develop rules to identify those radioactive waste streams that are subject to RCRA, and therefore subject to EPA and State agency regulation, and to establish procedures by which compliance can occur consistent with DOE's national security responsibilities.

For our nonradioactive hazardous waste, DOE facilities are in the process of submitting applications to appropriate EPA regional or State agency offices.

For those waste streams that are not subject to the Act because they are properly characterized as source, special nuclear, or byproduct material, DOE has structured internal management programs that are to be, to the maximum extent practicable, consistent with EPA regulations. DOE Order 5480.2 provides explicit DOE policy direction in this area. A copy is provided for the record. Consistent with security concerns, DOE has been willing to share information with public agencies on a comity basis and to make information on our program available to the general public. Our experience has been that, once jurisdictional issues are resolved, we can work together cooperatively with the regulatory agencies to achieve the objectives of the regulations most expeditiously. Completion of the rulemaking by DOE and EPA should assist the regulatory process for DOE and the regulating agencies.

The management of health and safety at DOE's facilities is continuing to receive increased management attention to assure that we meet our responsibilities in this area. The policy of the Department is that every reasonable precaution will be taken in the performance of work by DOE organizations and at all of our facilities to protect the health and safety of employees and the public; to protect the environment and prevent property damage; and to assure that the lines of responsibility and accountability through all organization elements for environmental, safety, health, and quality assurance-related matters exist and are clear, direct, and consistent with security requirements.

I submit there are few, if any, industrial enterprises in this country with a safety challenge equal to ours. The FY 1984 fatality, injury, and illness rates for DOE Federal and contractor operations continue to be approximately two-to-three times better than comparable rates in the private sector. None of the FY 1984 injuries or illnesses were caused by radiation exposure, and there were no accidental exposures in excess of the various allowable annual limits.

The statutory authority governing the Department's Environmental, Safety, and Health Program includes the DOE Organization Act which establishes a Departmental goal of protecting and enhancing environmental quality and assuring public health and safety; the Atomic Energy Act which exempts DOE and its contractors from certain licensing requirements (DOE requires that the Department's operations be conducted in accordance with comparable health and safety practices as required by EPA regulations, Occupational Safety and Health Act, Federal Regulations for Federal Employees); and the National Environmental Policy Act. This Act requires consideration of environmental factors in agency decisionmaking including, as appropriate, the preparation of environmental assessments and environmental impact statements.

Programs developed by DOE and its predecessor agencies over the past 35 years for the purpose of protecting the health and safety of its workers and the public have included the establishment of effective systems to manage radioactive material and assure protection of the public from such materials. This is confirmed in environmental monitoring reports prepared for each of our facilities.

In the mid-1960's, and accelerating in the 1970's and 1980's, the public concerns for the protection of the environment for future generations and the more immediate effects of industrial and municipal waste disposal practices increased. What was accepted industrial protection nationwide in the 1950's and 1960's has become unacceptable in recent years. During this period, legislation and regulations extending to Federal facilities showed the need for the DOE's Defense Programs to upgrade the environmental, safety and health practices in its plants. As a result, the Department is expending major resources to implement measures consistent with the requirements of the Clean Air Act, the Clean Water Act; the RCRA; the Toxic Substances Control

Act; and the Comprehensive Environmental Response Compensation and Liability Act.

In addition to Federal legislation, we are also affected by the requirements of the States within which we operate. Defense Programs has major facilities in 14 States that have passed legislation or are promulgating regulations related to protection of the environment.

The Department's FY 1986 budget request to Congress for Defense Programs includes nearly $380 million for programs related to environment, safety and health. These funds will be used for a variety of activities, ranging from health physics, fire protection, and industrial medicine to environmental protection. This resource level has increased by a factor of three over the past 4 years and is indicative of our commitment to implement those actions necessary to protect the workers and public and comply with applicable laws and regulations. Examples of projects being undertaken include $26.5 million in projects at the Y-12 Plant in Oak Ridge, Tennessee; FMPC, Fernald, Ohio; and RMI Extrusion Plant, Ashtabula, Ohio, to meet Clean Air Act requirements. Major new effluent conditioning and remedial actions associated with the Clean Water Act are being conducted at the Savannah River Plant in South Carolina at a cost of $27 million in FY 1986 and a total cost of $85 million. Total OR expenditures for ongoing Clean Water Act compliance are on the order of $60 million including a $15 million project to reduce mercury in plant effluents at the Y-12 Plant and a water pollution control project at the FMPC totalling $9.5 million.

Summary

In summary, it is our policy to take every reasonable precaution to assure the protection of the health and safety of our employees and the public. We have taken action to strengthen the oversight of the environmental, health, and safety aspects of our facilities; and we are moving aggressively to define and implement the corrective actions needed to assure that our facilities meet appropriate State and Federal environmental, safety, and health regulations and requirements as they evolve. The Department of Energy is dedicated to becoming a good neighbor to those people in the communities where our sites are located.

THE SECRETARY OF ENERGY
WASHINGTON, D.C. 20585

March 28, 1985

Honorable John Glenn
United States Senate
Washington, D.C. 20510

Dear Senator Glenn:

Thank you for your letter of February 26, 1985, in which you expressed concern that the National Institute for Occupational Safety and Health (NIOSH) is not assured sufficient access to individual medical records at Department of Energy (DOE) nuclear facilities.

As you observed in your letter, DOE did formally propose to provide NIOSH access to employee medical records at all DOE facilities. This proposal stemmed from the procedures required by the Privacy Act of 1974, which limits uses of such records (and access to them even within government agencies) to those uses specified in advance and noticed in the Federal Register.

In response to the proposal made in this case the Department received no comments supporting the action and many comments strongly opposing it. Most of these comments came from physicians who expressed considerable concern that release of medical records to a third party would compromise their doctor-patient relationships. As a result of this process, the Department concluded that the proposed use of such data should be tailored more carefully to those instances where there was a clear and demonstrated need. These records had been sought by NIOSH in order to conduct a health hazard survey at the Fernald facility. Accordingly, the final notice provided NIOSH access to records at the Fernald facility and continued in force the previously-granted access to medical records at the Portsmouth facility.

The need to consider such requests in this manner stems from the Privacy Act rather than from any distinctive treatment afforded DOE facilities in the Occupational Safety and Health Act. While the Privacy Act does impose certain substantive and procedural limitations on federal agencies in providing access to medical records, each individual employee may authorize access and the Department will afford NIOSH such access in accordance with the wishes of the employee.

I hope that this information will alleviate your concerns and assure you that we are working closely with NIOSH to permit it to carry out its responsibilities.

Yours truly,

John S. Herrington

John S. Herrington

THE DEPUTY SECRETARY OF ENERGY
WASHINGTON, D.C. 20585

April 19, 1985

Honorable John Glenn
Committee on Governmental Affairs
United States Senate
Washington, D.C. 20510

Dear Senator Glenn:

This is in response to your request for the views of the Department of Energy on S. 525, a bill cited as the "Radiation Reorganization Act of 1985." Our comments are limited to those provisions of the bill that would transfer to the Secretary of Health and Human Services the authority of the Secretary of Energy to conduct epidemiologic studies of the effects of radiation.

The Department strongly opposes enactment of this legislation. In particular, the Department takes exception to the finding in section 2(4) that the Secretary of Energy's responsibility for nuclear materials and weapons production conflicts with the Secretary's ability to perform studies of the health impacts of these activities. The Department of Energy historically has been the Federal agency charged with the responsibility to fund energy-related health effects studies. In carrying out this mandate, the Department has supported epidemiologic studies for approximately forty years, as part of an integrated health and environmental research program dealing not just with radiation, but also with chemical and other environmental toxins. The responsibility to conduct health effects studies is vested in the Office of Energy Research, whose management and funding for this purpose is independent of the other Secretarial offices involved in nuclear materials and weapons research and development.

The bill appears to be premised on the assumption that these studies are conducted by Federal employees within the Department of Energy. This is not the case. The Department relies on a network of National Laboratories, that are not operated or staffed by Federal employees, to conduct these epidemiologic studies. These Laboratories possess unique research facilities and multidisciplinary capabilities. Other Federal agencies, including the Department of Health and Human Services, recognize the Laboratories' expertise, and contract with the Department for the use of these skills and talents. In addition, the quality of the studies is assured through an extensive review process including both independent advisory committees to the Department and its contractors and the publication of all results in peer-reviewed scientific journals.

In a recent review (enclosed) of the Department's epidemiologic research program published in September, 1984, a Subcommittee of the Health & Environmental Research Advisory Committee, composed of respected scientists from noted universities and research institutes, found that this program has been of great importance as a source of scientific information about human radiation effects and acknowledged that there are many good reasons for the Department to conduct these studies. For example, the Subcommittee found that the Department is uniquely capable of giving the studies the priority they require to ensure timeliness and completeness and recommended that the studies not be transferred to another agency.

Since the Department utilizes the best available technical capabilities and scientific methods in conducting its epidemiologic studies, and publishes the results for objective peer review, there would be no scientific benefits from the proposed transfer. It would not be expected to improve the quality, objectivity, or usefulness of these studies. Rather, such a transfer is likely to duplicate Departmental activities that must continue in order to meet on-going mission needs, regardless of the transfer of this authority. Furthermore, it would result in an unwarranted expenditure of funds and considerable delay while another agency developed the technical capability necessary to analyze and understand the extremely complex data involved in these studies. In addition, the Department of Health and Human Services, or its contractors, would be required to renegotiate a number of agreements with states and other federal agencies by which these organizations provide the National Laboratories, who negotiated and are implementing the agreements, with necessary data for the studies. More importantly, the Department of Energy has given a high budgetary and programmatic priority to these studies because of the need for the results in the conduct of our nuclear weapons program, and also because of our inherent responsibility as an employer.

The Department strongly opposes the proposed transfer of authority to conduct radiation health effects studies to the Department of Health and Human Services since it would not improve the quality, objectivity, or reliability of those studies. Rather, it could prove disruptive of important on-going research. Accordingly, the Department strongly opposes enactment of S. 525.

The Office of Management and Budget advises that enactment of S. 525 would not be consistent with the Administration's objectives.

Yours truly,

Danny J. Boggs

Danny J. Boggs

Enclosure

cc: William V. Roth, Jr.
Chairman
Committee on Governmental Affairs

U.S. Department of Energy
Washington, D.C.

ORDER

DOE 5480.2

12-13-82

SUBJECT: HAZARDOUS AND RADIOACTIVE MIXED WASTE MANAGEMENT

1. PURPOSE. To establish hazardous waste management procedures for facilities operated under authority of the Atomic Energy Act of 1954, as amended (AEA). The procedures will follow, to the extent practicable, regulations issued by the Environmental Protection Agency (EPA) pursuant to the Resource Conservation and Recovery Act of 1976 (RCRA). Although Department of Energy (DOE) operations conducted under authority other than the AEA are subject to EPA or State regulations conforming with RCRA, facilities administered under the authority of the AEA are not bound by such requirements.

2. SCOPE. The provisions of this Order apply to all DOE operations conducted under the authority of the Atomic Energy Act of 1954 (42 U.S.C. 2011, et seq.) that result in the generation, transportation, treatment, storage and/or disposal of hazardous waste. In addition, the provisions of this Order apply to all operating and onsite service contractors with contracts that provide for the generation, transportation, treatment, storage, and/or disposal of hazardous waste, and contain contract provisions requiring compliance with this Order. Hazardous waste management at DOE operations conducted under authority other than the Atomic Energy Act of 1954 is covered by DOE 5480.1A.

3. REFERENCES.

   a. Atomic Energy Act of 1954, 42 U.S.C. 2011, et seq., which authorizes the conduct of atomic energy activities.

   b. Resource Conservation and Recovery Act of 1976, 42 U.S.C. 6901, et seq., which authorizes the Environmental Protection Agency (EPA) to promulgate hazardous waste management regulations.

   c. 40 CFR 260, "Hazardous Waste Management System: General," which provides general standards for hazardous waste management.

   d. 40 CFR 261, "Identification and Listing of Hazardous Waste," which identifies and lists hazardous wastes.

   e. 40 CFR 262, "Standards Applicable to Generators of Hazardous Waste," which provides standards for generators of hazardous waste.

   f. 40 CFR 263, "Standards Applicable to Transporters of Hazardous Waste," which provides standards for transporters of hazardous waste.

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Office of Operational Safety

g. 40 CFR 264, "Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," which provides standards for owners and operators of hazardous waste management facilities with permits.

h. 40 CFR 265, "Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities," which provides standards for owners and operators of hazardous waste management facilities with interim status.

i. DOE 5480.1A, ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION PROGRAM FOR DOE OPERATIONS, of 8-13-81, which establishes the Department's environmental protection, safety, and health protection program.

j. DOE 5700.6A, QUALITY ASSURANCE, of 8-13-81, which sets forth principles and assigns responsibilities for establishing, implementing, and maintaining programs of plans and actions to assure quality achievement in DOE programs.

k. DOE 5482.1A, ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION APPRAISAL PROGRAM, of 8-13-81, which presents the Department's policy and requirements for appraisal of environmental protection, safety, and health protection programs.

l. DOE 5484.1, ENVIRONMENTAL PROTECTION, SAFETY, AND HEALTH PROTECTION INFORMATION REPORTING REQUIREMENTS, of 2-24-81, which establishes requirements and procedures for reporting and investigating matters of environmental protection, safety, and health protection significance to DOE operations.

m. DOE 5484.2, UNUSUAL OCCURRENCE REPORTING SYSTEM, of 8-13-81, which establishes a system for reporting unusual occurrences having programmatic significance.

n. DOE 5500.2, EMERGENCY PLANNING, PREPAREDNESS, AND RESPONSE FOR OPERATIONS, of 8-13-81, which provides for the coordination and direction of DOE planning, preparedness, and response to operational emergencies involving DOE or requiring DOE assistance.

o. DOE 5500.3, REACTOR AND NONREACTOR NUCLEAR FACILITY EMERGENCY PLANNING, PREPAREDNESS, AND RESPONSE PROGRAM FOR DEPARTMENT OF ENERGY OPERATIONS, of 8-13-81, which establishes requirements for development of site specific emergency plans and procedures for radiological emergencies at DOE nuclear facilities.

p. DOE 5632.1, PHYSICAL PROTECTION OF CLASSIFIED MATTER, of 7-18-79, which prescribes DOE requirements for physical protection of classified matter.

q. DOE 5632.2, PHYSICAL PROTECTION OF SPECIAL NUCLEAR MATERIAL, of 2-16-79, which establishes minimum physical protection standards for special nuclear materials.

r. DOE 5820.1, MANAGEMENT OF TRANSURANIC CONTAMINATED MATERIAL, of 9-30-82, which establishes guidelines for the generation, treatment, packaging, storage, transportation, and disposal of transuranic contaminated material. Guidance related to other radioactive contaminated materials is also included.

4. DEFINITIONS.

a. Atomic Energy Act Facilities are those DOE facilities operated under authority of the Atomic Energy Act of 1954 as amended.

b. DOE Operations are those activities funded by DOE for which DOE has responsibility for environmental protection, safety, and health protection.

c. Exemption means a release from the requirements of this Order or any selected requirements of this Order.

d. Hazardous Waste is waste that is identified or listed in 40 CFR 261. Source, special nuclear material, and byproduct material as defined by the Atomic Energy Act of 1954, as amended, are specifically excluded from the term hazardous waste.

e. Hazardous Waste Facility means all DOE owned or controlled contiguous land, structures, other appurtenances, and improvements on the land used for treating, storing, or disposing of hazardous waste. A facility may consist of several treatment, storage, or disposal operational units (e.g., one or more landfills, surface impoundments, or combinations).

f. Headquarters Coordinating Team is the group of representatives designated by program Secretarial Officers (see paragraph 4i) and other Headquarters officials created to assist the Assistant Secretary, Environmental Protection, Safety, and Emergency Preparedness (EP-1) in developing policy and guidance for the hazardous waste management program.

g. Radioactive Mixed Waste is radioactive waste which also contains hazardous waste constituents.

h. Operating Level is the organization performing the actual work or job related tasks. It may be a contractor performing work for DOE or it may be an element of DOE itself.

i. Program Secretarial Officer is an outlay program manager and includes the Assistant Secretaries for Conservation and Renewable Energy; Fossil Energy; Nuclear Energy; Defense Programs; Environmental Protection, Safety, and Emergency Preparedness; and the Director of Energy Research.

j. Radioactive Waste. Solid or fluid materials of no value containing radioactivity; discarded items such as clothing, containers, equipment, rubble, residues or soils contaminated with radioactivity; or soils, rubble, equipment or other items containing induced radioactivity such that the levels exceed safe limits for unconditional release.

k. Transuranic (TRU) Contaminated Material is material which, without regard to source or form, contains certain alpha-emitting radionuclides with long half-lives in concentrations greater than 100nCi/g.

l. Transuranic Waste (TRU Waste) is TRU contaminated material which has been declared as having no significant economic value or use.

5. BACKGROUND. DOE operations conducted under authority other than the Atomic Energy Act are subject to Environmental Protection Agency or State regulation pursuant to the Resource Conservation and Recovery Act of 1976.

6. POLICY. It is the policy of DOE to:

a. Protect the environment and the safety and health of the public and DOE and DOE contractor employees by managing operations in a manner to provide for safe handling of hazardous waste generated, transported, treated, stored, or disposed of by those operations.

b. Promote the recovery of energy and other resources from discarded materials.

c. Implement the program in a cost effective manner.

7. RESPONSIBILITIES AND AUTHORITIES. Assurance that DOE hazardous waste is managed in an environmentally acceptable manner is a part of the overall environmental protection, safety, and health protection program as established by DOE 5480.1A. As a supplement to the responsibilities and authorities assigned by DOE 5480.1A, the responsibilities and authorities specific to hazardous waste activities are assigned as follows:

a. Program Secretarial Officers shall:

(1) Assure that funds are provided in the DOE budgets to effectively implement the program.

(2) Review and approve the implementation plans prepared by each field organization in accordance with this Order.

(3) Verify that effective programs are implemented.

(4) Identify issues and problems regarding hazardous wastes and take required corrective actions.

(5) Upon request, cooperate with Assistant Secretary for Environmental Protection, Safety, and Emergency Preparedness (EP-1) by providing representation to the Headquarters coordinating team assigned to develop policy and other guidance for hazardous waste activities.

(6) Take such action as may be appropriate to assure safety, including directing the field office manager to curtail and suspend their operations when, in their opinion, such operation would result in an undue environmental protection, safety, or health protection risk.

b. Managers of Operations Offices shall:

(1) Define the extent of hazardous waste management activities at Atomic Energy Act facilities under their purview.

(2) Perform an initial evaluation of all hazardous waste management activities in accordance with Chapter I of this Order.

(3) Prepare an implementation plan for this Order in accordance with Chapter I, paragraph 1.

(4) Develop and implement a program to assure that hazardous wastes at facilities for which they are responsible are managed in accordance with the requirements of this Order.

(5) Document in the implementation plan where full compliance with this Order cannot be achieved due to unique characteristics of the sites and/or facilities under their jurisdiction or due to unrealistically high costs compared to the risks involved. For situations where management of wastes pursuant to this Order would result in an unrealistically high cost compared to the risk involved, alternative methods of handling waste which would provide comparable levels of safety and environmental protection at reduced costs shall be taken, in accordance with the provisions of Chapter I of this Order.

(6) Submit hazardous waste management reports to EP-1 in accordance with Chapter I, paragraph 2e, with copies to the responsible program secretarial officers.

(7) Take such action as may be appropriate to assure safety, including curtailment and suspension of operations, when, in their opinion, such operation would result in an undue environmental protection, safety, or health protection risk.

c. The Assistant Secretary, Environmental Protection, Safety, and Emergency Preparedness, shall:

(1) Provide an independent overview of the status of Departmental compliance with the requirements of this Order and planned corrective action.

(2) Develop policy and guidance for DOE hazardous waste activities consistent with 40 CFR 260-265, DOE Orders, standards, and guides, as appropriate.

(3) Conduct appraisals of field organization hazardous waste management programs in accordance with DOE 5482.1A.

(4) Determine the need for and sponsor research and development efforts to solve generic DOE hazardous waste problems, in conjunction with Headquarters program offices.

(5) Prepare reports on the status of the Department's compliance efforts and its compliance action plans for the program secretarial officers.

(6) Reviews field office implementation plans for this Order for consistency and the advisability of site specific exemptions, and advises the cognizant program secretarial officer on the adequacy of the proposed implementation plans. Advises the Under Secretary if, in the opinion of EP-1, the approved implementation plan is significantly deficient and the issue cannot be resolved with the cognizant program secretarial officer.

(7) Chair the Headquarters coordinating team.

William S. Heffelfinger
Director of Administration

CHAPTER I

GENERAL HAZARDOUS WASTE PROGRAM REQUIREMENTS

1. IMPLEMENTATION PLAN.

   a. Each operations office shall evaluate its hazardous waste management program for facilities under its jurisdiction and identify all changes necessary to assure that, except as provided in paragraph 1c and 1d below, it complies with the technical, as opposed to the procedural, hazardous waste management requirements of 40 CFR 260-263 and 265. The implementation plan shall further include a plan for bringing facilities into compliance with technical requirements of 40 CFR 264 at the earliest practicable date.

   b. Following the evaluation, the operations office shall determine and document plans, including timetables, to achieve compliance with the requirements of this Order.

   c. Each operations office implementation plan shall identify any extent to which where full compliance with this Order cannot be achieved. In each area where full compliance cannot be achieved, an exemption may be requested based on the unique characteristics of the sites and/or facilities, or unrealistically high costs compared to the risks involved. Any requested exemption must be approved by the cognizant secretarial officer as part of the implementation plan approval, upon a finding by the secretarial officer that the conditions described in page 7, paragraph 7c(7) of DOE 5480.1A have been satisfied.

   d. Each operations office's implementing programs may contain alternatives to those articulated in 40 CFR 260-265. Alternative protective actions or procedures which provide assurance of equal or greater environmental protection, safety, and health protection shall be approved by the operations office manager prior to implementation. Each alternative determination shall be well documented and auditable. A summary of such approved alternatives will be provided in the annual hazardous waste management reports specified in paragraph 2e(3), below.

2. PROGRAM REQUIREMENTS. Hazardous waste management programs shall comply with the standards of 40 CFR 260-265, except as provided for in paragraph 1, above. The programs should include, but not be limited to, the following requirements:

   a. Inspections. Inspections shall be conducted by the operating level, using the requirements of 40 CFR 265.15 or 40 CFR 264.15.

b. Security.

(1) Access to hazardous waste facilities shall be controlled in accordance with requirements of 40 CFR 265.14 or CFR 264.15.

(2) Where hazardous waste facilities are located on the same site with radioactive waste management activities, security measures will also comply with DOE 5632.1 and DOE 5632.2, as appropriate.

(3) The requirements of paragraph 2b(1), above, are satisfied if the facility is located within a site that has controlled access in accordance with 40 CFR 265.14 or 40 CFR 264.15.

c. Personnel Training. Training programs shall be conducted in accordance with the requirements of 40 CFR 265.16 or 40 CFR 264.16.

d. Emergency Response Procedures. Emergency preparedness and response procedures shall be established in accordance with the standards of 40 CFR 265, Subparts C and D or 40 CFR 264, Subparts C and D, DOE 5500.2, and DOE 5500.3.

e. Recordkeeping and Reporting.

(1) Each facility shall maintain an operating record in accordance with the requirements of 40 CFR 265.73 or 40 CFR 264.73.

(2) Notification, investigation, and reporting of accidental occurrences shall be conducted in accordance with DOE 5484.1 and DOE 5484.2.

(3) Annual hazardous waste management reports shall be submitted by the operations offices to EP-1 in accordance with guidelines to be provided.

(4) EP-1 shall prepare periodic reports of: Departmental compliance status; and compliance action plans. These shall be provided to the Under Secretary and secretarial officers, as appropriate.

f. Transportation System.

(1) Generators shipping hazardous waste offsite shall utilize the manifest system specified in 40 CFR 265.70-72 or 40 CFR 264.70-72.

(2) Generators of hazardous waste transported between locations within the same boundary must assure that such wastes are properly identified.

(3) DOE shipments of hazardous waste when transported shall be in accordance with all applicable transportation laws and regulations.

g. Waste Analysis. Waste analysis procedures shall be established in accordance with the requirements of 40 CFR 265.13 or 40 CFR 264.13.

h. Groundwater Monitoring. Groundwater monitoring systems shall be established in accordance with the standards of 40 CFR 264, Subpart F or 40 CFR 265, Subpart F.

i. Closure and Post-Closure. Provisions and plans for closure and post-closure of facilities shall be made in accordance with standards of 40 CFR 265, Subpart G or 40 CFR 264, Subpart G.

j. Offsite Treatment, Storage or Disposal. Any offsite treatment, storage, or disposal of hazardous waste will be in accordance with all applicable regulations.

3. INTERFACES WITH ENVIRONMENTAL PROTECTION AGENCY AND STATE OFFICIALS. Interfaces between Department representatives and EPA or State compliance officials shall be in accordance with the DOE/EPA Memorandum of Understanding, copies of this document can be obtained by calling the Office of Operational Safety, Health, and Environment, EP-321, on FTS 233-5684.

CHAPTER II

GUIDANCE FOR MANAGING RADIOACTIVE MIXED WASTE

1. INTRODUCTION. This chapter is included as interim guidance pending the issuance of a DOE directive for radioactive waste management. The guidance set forth here applies to those instances where radioactive waste contains hazardous waste constituents.

2. MANAGING RADIOACTIVE MIXED WASTE. To assure an effective program for the management of radioactive mixed wastes, the following guidance shall be observed by the field office manager:

   a. For high level and transuranic mixed waste, DOE 5820.1 radiological control requirements for handling, packaging, transportation, storage, disposal, and monitoring shall be applied. The field office manager shall verify that these requirements provide adequate protection for the public and the environment from potential hazards which may derive from hazardous characteristics other than radioactivity, and shall impose any additional requirements that will be necessary to achieve such protection.

   b. For low level radioactive mixed waste, DOE 5820.1 radiological control requirements for handling, packaging, transportation, storage, disposal, and monitoring shall be applied. Additional controls should be applied, as necessary, to assure a degree of protection of the environment and the safety of the public equivalent to that afforded under 40 CFR 260-265.

REVIEW OF THE OFFICE OF HEALTH & ENVIRONMENTAL RESEARCH PROGRAM

EPIDEMIOLOGY

Prepared by a Subcommittee of the Health & Environmental Research Advisory Committee
Office of Energy Research, Department of Energy

September 1984

EXECUTIVE SUMMARY

The DOE Health and Environmental Research Advisory Committee (HERAC) has reviewed the Department's epidemiology research program within the Office of Health and Environmental Research (OHER). In a letter dated March 19, 1984, Dr. Alvin W. Trivelpiece, Director of the Office of Energy Research, asked HERAC to conduct this review and advise him on the appropriateness and future directions of the program (see Appendix A). The review was conducted by a subcommittee of HERAC which included members of HERAC and other scientists selected for their expertise in areas related to the program (see Appendix B). The report was reviewed and approved by HERAC. This summary is organized according to the questions raised by Dr. Trivelpiece's charge, followed by summary recommendations.

1. Need for the DOE Epidemiology Program?

The DOE and its predecessors, ERDA and the AEC, have historically taken the lead in anticipating human health consequences from radiation and other toxic agents. The AEC/ERDA/DOE sponsored studies in radiation epidemiology have provided much of the presently available information on the human health effects of ionizing radiation, both somatic and genetic. The program has supported studies of A-bomb survivors, patients receiving radium or thorotrast for therapuetic or diagnostic purposes, radium dial painters, the Marshallese Islanders exposed to fallout from weapons test in the Pacific, radiologists, infants exposed in utero during maternal X-ray pelvimetry, uranium miners, and various other exposed groups including its own and contractor employees. The program has been of immense importance as a source of scientific information about human radiation effects. The current scope of the program includes the Japanese A-bomb study, medium-to-high dose radiation studies (radium dial painter and New Mexico uranium miner studies), low dose studies of DOE and contractor workers ,including special studies of those exposed to uranium or plutonium, and studies of risks associated with new energy technologies (shale oil, coal gasification and coal liquefaction workers).

There are several good reasons for the DOE to support epidemiologic research related to the nuclear and fossil energy industries. The DOE has an inherent responsibility to monitor and ensure the safety of employees in these industries and of people who may live near the related facilities. The Department plays a unique, central role in managing many energy- and weapons-related programs and thereby has access to a large resource of occupational health data. The DOE's major commitment to these programs argues strongly for strengthening its leadership role in determining the human health effects from such technologies. The DOE cannot entrust this commitment to other government agencies where it may deteriorate through lack of interagency cooperation or future loss of priority. The DOE also supports a large toxicology research program that provides additional strength to its epidemiologic research. The working relationship with the DOE occupational hygiene and health physics programs is an invaluable resource that the DOE must maintain and cultivate.

Workers at the DOE facilities have had exposure to radiation and a number of other toxic agents. For the purpose of worker protection DOE therefore needs to have an epidemiological surveillance and monitoring program to assess possible adverse long-term effects from such exposures and to validate the appropriateness of the standards. Having available systematic databases on employee exposures, risk factors and health experience, with the findings from these published in the open scientific literature, is also important for documentation and equity in legislative and judicial proceedings. Thus, strictly in regard to surveillance, it is absolutely essential that the DOE support high quality epidemiologic studies of its present and past employees.

2. Scientific Merit of the Work?

There are compelling scientific reasons mandating support for the epidemiologic research. These studies address several important present day gaps in our knowledege of human radiation effects. The study by the Radiation Effects Research Foundation (RERF) of the A-bomb survivors in Japan is the preeminent radiation epidemiology study in the world. It has provided the best human information to date on a number of central radiobiological issues, with regard to both somatic and genetic effects. Also, the DOE-worker studies provide unique and important sources of information. For instance, the plutonium workers study is the only major study in this nation, and perhaps in the world, to assess the human health effects of Pu exposure, an issue of great public concern and significance for future policy with regard to the use of nuclear fuels.

Although estimates of low-dose radiation effects have been derived largely by extrapolation from high-dose studies and from our understanding of biological mechanisms, there is a need to verify directly the estimates made by extrapolation. The DOE-supported low-dose radiation studies attempt to do this. Their major scientific contribution to radiation epidemiology may be to establish narrower empirical upper limits on risk at low doses than have been available heretofore. The DOE worker studies also have the potential for scientific contribution to our knowledge of the effects of other toxic agents, alone and in combination. This is an area of pressing need for both scientific and sociopolitical reasons.

Much of the resources devoted to the DOE worker studies over the last several years have, of necessity, been used to assemble large, historical databases. As the database assembly is completed, these studies have the potential for increasing their scientific productivity and addressing many questions about the health effects of nuclear and non-nuclear technologies. The need for epidemiologic health surveillance together with the potential for scientific contributions constitute a persuasive rationale for strong continued support of these studies.

3. Are there other energy-related human health issues which should receive higher priority?

The Committee recommends increasing attention to the epidemiologic study of potential toxic agents other than radiation, and, particularly, the investigation of the joint effects of exposure to multiple toxic agents. Several recent legislative and judicial developments have indicated a pressing need for such information. For situations involving exposures to combinations of agents, the use of exposure control standards based on single agents may or may not account for the total risk. This is an important industrial hygiene concern as well as a major stumbling block to the resolution of injury litigations. It requires the best possible quantitative data on humans. Especially with regard to radiation plus other hazardous agents, the DOE has both the need and the capability to develop such data.

Similarly, a strong case exists for the collection of more and better information on smoking and other lifestyle factors in the DOE epidemiologic studies. Current information is inadequate to determine if risks associated with radiation or other toxicants are modifiable by lifestyle factors. There is a pressing need to reduce such uncertainties in response to both scientific and sociopolitical concerns.

One of the ultimate goals of the epidemiology program is to validate our understanding of the mechanisms underlying various health effects. As knowledge about mechanisms is developed by molecular biologists, toxicologists, radiobiologists and others, it is desirable that interdisciplinary programs be instituted to apply the insights and techniques.

4. What directions should the RERF studies take in the future? Should support of this work be continued indefinitely? Are there other scientific approaches that should be employed in the RERF studies?

The RERF A-bomb studies in Japan strengthen the scientific aspects of the present OHER epidemiology program with respect to both genetic effects and disease endpoints. These studies are, without doubt, the most important and fruitful human studies concerning the effects of ionizing radiation that have ever been undertaken; their continued support by DOE is certain to prove rewarding. The RERF studies of solid tumors will become increasingly informative in years to come as more radiogenic cancers accumulate and as the younger groups at the time of exposure to the bombs reach the ages of greatest cancer risk. As the number of radiation-induced cancers is augmented year by year, it will be possible to obtain more precise estimates of the magnitude and temporal pattern of radiogenic cancer risk. RERF substudies are now ongoing or being planned which will enhance our scientific knowledge of the role of age at exposure, sex, lifestyle factors, and other environmental exposures in modifying the carcinogenic response to radiation.

With reference to genetic epidemiology, OHER has a long record of support of human studies of mutation in Hiroshima and Nagasaki. These studies, which are the only really significant source of data on the genetic effects of radiation on humans, are about to enter a new and more promising phase with implementation in Hiroshima and Nagasaki in the next several years of the newest techniques for studying proteins and DNA. At the same time, efforts are underway to preserve the cell lines from the A-bomb survivors and their offspring, so that this unique resource will not disappear but will be available for future genetic studies.

Summary Recommendations

The subcommittee has a number of recommendations to make regarding the epidemiology program. More detailed recommendations are given in the main body of the report.

- We urge strong support of the OHER epidemiology program for two reasons. (a) In this era of litigation over the health effects of exposure to ionizing radiation at low levels, the DOE cannot affort to be without a substantial and high quality database from which to study the effects of exposures incurred by its workers. Because of the various legislative and judicial proceedings in the radiation area, it behooves the DOE to have available the means to evaluate the risk associated with nuclear technologies. The same reasoning applies to the epidemiologic study of other potentially hazardous agents in the workplace and to non-nuclear energy technologies. (b) Among the studies supported by OHER are classic studies of exposures to internal emitters (radium dial painters and plutonium workers) and external radiation (RERF A-bomb study), which are providing unique and invaluable scientific data.

  It cannot be overemphasized that a program such as this requires continuity in funding. It takes a number of years to assemble such large datasets, and maintenance of good quality documentation of exposures and health endpoints requires a sustained commitment of resources.

- We recommend that certain aspects of the program be strengthened. The program would benefit from a review and clear statement of its objectives, and the rigorous use of the objectives in program evaluation and program planning. In addition, we recommend an increased emphasis on targeted, higher-dose studies which have the potential to address radiobiologic questions for which we currently have little or no human data.

Measures to improve the coordination among the several epidemiologic studies, and to increase the communication between the epidemiologic and experimental research groups in OHER, would also enhance the program. Coordinated, joint analyses of the several low-dose studies would increase their scientific value by allowing more reliable estimation of bounds on the magnitude of low-dose effects.

One of the issues facing the DOE is how to respond to litigation that is being pressed against it. The litigation almost inevitably involves questions of dosimetry, evidence that there have or have not been adverse effects, synergism between radiation and other types of exposures, credibility of the conventional estimates of risk as applied to low-dose situations, etc. It seems clear that attention should be given to ensuring that the epidemiology databases are designed and implemented in such a way as to be maximally relevant and effective in providing pertinent information in such litigation situations; as a minimum, this would mean having complete and accurate information on exposures to radiation and other toxicants, and it is hoped that, over time, information on smoking and other lifestyle factors can be assembled.

- We believe the program would improve its credibility in the scientific community and among the general public if more openness is fostered by the OHER management. Measures to accomplish this might include: open solicitations for competitive research proposals in areas of program interest, increased use of peer review mechanisms with more outside scientific experts, mechanisms to increase collaboration between the DOE epidemiologic research groups and university groups, and independent review and re-analysis of results by scientists outside the DOE program.

- The Committee endorses the new directions the RERF studies have been or will shortly be taking, namely, to increase the information on factors which may modify the carcinogenic response to radiation, and to develop new, more sensitive techniques to study mutations. DOE support of the RERF studies is extremely important and should continue for at least the next twenty years.

- The DOE should explore the potential of new approaches in genetic studies, not only for human populations but in a mouse model. A prompt evaluation of the usefulness of these approaches with a mouse model would not only validate (or refute) the investment in a human study but permit explorations of the nuances of the approaches which are now possible for potentially mutagenized human populations. It is further recommended that in any major new round of genetic studies, in the same populations of both humans and mice, indicators of genetic damage in somatic cells be pursued simultaneously, in order to begin to build the necessary bridges between somatic cell and germ cell studies.

- We recommend that efforts be made by the epidemiologic program management to identify and address gaps in our knowledge. The subcommittee identified several such gaps, including information on: the magnitude of risk from neutron exposures; the effects of radiation dose-rate on the magnitude of risk; the joint effects of workplace exposures to multiple toxic agents; how lifestyle factors (e.g., smoking) may modify people's risk from radiation or other hazardous agents in the workplace; the role of genetic and host-susceptibility factors in modifying risk from radiation.

DETAILED REPORT

EPIDEMIOLOGY SUBCOMMITTEE MANDATE AND ACTIVITIES

In response to Dr. Alvin Trivelpiece's charge to the Health and Environmental Research Advisory Committee (see Appendix A), a Subcommittee was formed to provide an evaluation and overview of the DOE-OHER Epidemiology Program. To provide an independent and objective review, outside members were selected who had little or no involvement with the Epidemiology Program. The Subcommittee included a diversity of expertise, namely, radiation epidemiology, environmental epidemiology, toxicology, pathology, genetics and risk assessment. The affiliations of Subcommittee members appear in Appendix B.

The Subcommittee has attempted to address each of Dr. Trivelpiece's questions in this report. We did not undertake independent evaluations of individual projects but confined ourselves to an examination of the general nature of the program in relation to the field of epidemiology, and especially radiation epidemiology.

The Subcommittee benefited by information from various sources: a DOE Contractors Meeting in May 1984, where presentations were made by DOE-supported epidemiologists; a presentation by Seymour Jablon at our meeting on July 9-10 describing the research on A-bomb survivors conducted by the DOE-supported Radiation Effects Research Foundation (RERF); a report of the 1982 DOE Radiation Epidemiology Contractors' Workshop, which provided useful information on specific programs. Of particular importance as a complement to our deliberations were the reports of site visits made to the epidemiology groups at most of the DOE labs in 1982-83, an activity initiated by the OHER Epidemiology Program. These reports were an extremely valuable resource on specific programs and their accomplishments.

THE ROLE OF OHER-DOE IN EPIDEMIOLOGY: Past, Present and Future

The AEC/ERDA/DOE sponsored studies in radiation epidemiology have provided most of the information we now have on the human health effects of ionizing radiation, both somatic and genetic. Supported studies include: A-bomb survivors, patients receiving radium or thorotrast for therapuetic or diagnostic purposes, radium dial painters, the Marshallese Islanders exposed to fallout from weapons test in the Pacific, radiologists, infants exposed in utero during maternal X-ray pelvimetry, uranium miners, and various other exposed groups, as well as DOE's own employees. The importance of this program has been very great from the scientific standpoint.

Epidemiologic studies presently supported by DOE largely concern as subjects DOE and DOE-contractor employees along with the A-bomb survivors and radium dial painters. There are also several small studies of workers involved in the production of energy from sources other than those in general use. The program projected for the future appears to reflect the current, rather diffuse objectives, and could benefit from a formulation of more focused scientific objectives.

RATIONALE AND OBJECTIVES OF THE OHER-DOE EPIDEMIOLOGY PROGRAM

There are several good reasons why DOE should be conducting epidemiologic research related to nuclear and fossil energy industries. DOE bears an important responsibility for the safety of employees in these industries and of people who may live near the related facilities. The Department plays a unique, central role in managing many energy- and weapons-related programs and thereby has access to a large resource of occupational health data. It also supports a large toxicology research program which gives additional strength to its epidemiology research.

The knowledge needed to protect workers has diverse sources, including formal studies of the workers themselves and other studies supported by DOE and its predecessor agencies. To enhance the level of knowledge, studies of workers are useful but certainly not sufficient: opportunities for studies of other populations, especially those exposed to higher than occupational levels are essential. The knowledge gained through the program of epidemiologic studies thus benefits society generally, and provides part of the underpinning for radiation protection programs of wider applicability, for risk estimation, and for understanding disease mechanisms, especially cancer and genetic effects.

Potential objectives of the DOE-OHER epidemiology program include:

Objective A:

To provide comprehensive health surveillance programs for workers in Department of Energy facilities and for populations who reside in the vicinity of these facilities.

Although many criticisms have arisen concerning the openness and objectivity of the OHER Epidemiology Program, the Department of Energy cannot ignore its inherent responsibility to monitor the health of workers and the public who may be exposed to toxic products used in its facilities. This has several ramifications. It provides a data base for establishing or modifying exposure control standards, and it establishes a basis for a legal response to court challenges of past procedures of the energy industry which involved exposures to workers or to the public.

Most of the current efforts focus on documentation of potential health effects of ionizing radiation. However, this surveillance needs selective expansion to include exposures to chemically toxic substances and to mixtures of chemicals and radiation. The Department of Energy must continue to support these efforts in order to demonstrate its responsiveness and sensitivity to public concerns, even if there is little possibility of observing meaningful changes in the health status of the study populations. Because criticisms of the Department of Energy would very likely increase with cessation of its health surveillance programs, the responsibility for collecting and maintaining worker dosimetry and health records should continue to receive priority funding and not be allowed to transfer to other agencies where its future support might be de-emphasized at a later time.

With respect to surveillance of the health status of populations living near Department of Energy facilities, the role of the OHER Epidemiology Program is less clear. At a minimum, researchers should be prepared to respond to reports of increased health risks to the public resulting from Department of Energy programs. This need not require the development of new data bases in most cases, since health statistics for localities are becoming increasingly available.

Objective B:

To conduct epidemiologic studies to improve our scientific understanding of toxicologic processes and develop dose-response relationships.

With the documentaion of the health status of workers exposed to toxic agents, rigorous analyses should determine if they incurred added risk. This information has use in formulating exposure control standards for workers and the public, and in resolving potential injury litigation. One step in meeting this objective is the development of quantitative exposure-dose-risk relationships; the main limitation in establishing these relationships is usually the lack of quantification of exposures. In any event, analyses should be performed to determine the upper limit of health risks that may relate to specific levels of exposure.

To fulfill objective B, potential study populations will need to undergo careful screening to determine their suitability for developing quantitative exposure-risk relationships. This should include consideration of population size, exposure magnitudes, quality of exposure information, period available for follow-up study, potential for completing a successful study and applicability of the study to important Department of Energy concerns. The Subcommittee recognizes that many potential study populations are suitable for meeting Objective A, but few are good candidates for meeting the more selective criteria related to Objective B. Detailed discussion of this appears in reports by the National Research Council (1) and Dreyer *et al.* (2).

Objective C:

To advance the science of epidemiology and risk assessment while focusing on studies of health effects caused by ionizing radiation, both alone and in combination with exposures to toxic chemicals.

The Department of Energy continues to occupy a leading position in the advancement of scientific knowledge on the health effects of ionizing radiation in human populations. Researchers in its epidemiology program have access to vast data bases containing radiation exposure records for thousands of nuclear industry workers and people exposed to nulcear weapons explosions. This working relationship with Department of Energy occupational hygiene programs is an invaluable resource that the DOE must maintain and cultivate, and one that it cannot entrust to other government agencies where it may deteriorate through lack of interagency cooperation or future loss of priority.

Because the current radiation epidemiology program includes studies of worker populations located at many different types of industrial facilities throughout the United States, it is necessary to develop database linkages which will permit the coordination of research results necessary to support common findings. This approach is vital to gain an understanding of health risks caused by exposures to multiple toxic agents in workplaces, an issue of primary concern in the development of future exposure control guidelines. This approach may also entail the design of a series of methodologic studies to learn how to optimize such multi-facility research.

The Department of Energy epidemiology program has produced most of our current knowledge on the effects of low-level radiation in human populations. It has also identified important information gaps that are now being addressed through combined efforts of the OHER epidemiology and laboratory toxicology programs. Examples of this research are the development and use of short-term bioassays for human risk assessment, the evaluation of genetic risks of radiation and the projection of health risks from exposures to complex mixtures of toxic substances. Health effects from toxic chemicals may be observed in some of the worker populations, but adequate retrospective exposure information will be very difficult to obtain. However, most of the studies will at least provide some indication as to whether or not current exposure standards need modifying or if legal disputes are likely to arise in such numbers as to require broad-based legislative or judicial actions.

PROGRAM EVALUATION BY THE SUBCOMMITTEE

In evaluating the DOE worker studies, it is important to bear in mind that they have two components: (1) the protection and surveillance of workers' health; and (2) the creation of new and useful scientific knowledge. Regarding the second component, no matter how well done technically the low-dose studies are in regard to radiation effects, they have intrinsic limitations in their scientific value, because of their constraints having to do with the low frequency and proportion of cancers (or other untoward health effects) attributable to radiation exposure. (Also see Appendix C).

The magnitude of low-dose effects, a main issue in these studies, is a practical matter of great concern. However, it seems likely that reliable estimates of low-dose effects will have to be derived (a) from the consequences of exposures at higher doses, where the magnitude of effects can be measured, and (b) with the aid of dose-response models based on the best theoretical understanding of mechanisms. The main scientific contribution of the low-dose studies is made largely insofar as they permit establishing useful upper limits on risk.

It should be noted that a blanket indictment of "low dose" studies should not be made because: (1) the studies are also helping fulfill DOE's responsibility for health surveillance; (2) having a few low-dose studies of low-LET radiation is probably important to assess and answer the claims by some parties that risks are, say, 20 or 100 times as great as generally believed; (3) the studies can also address the issues of concomitant exposures to other potentially hazardous agents; and (4) some of the studies address important gaps in our knowledge. (E.g., the plutonium workers study is the only major study in this nation, and perhaps in the world, to assess the human health effects of Pu exposure; the low-to-moderate dose, New Mexico uranium miners study may provide important information about radon exposures at levels below those of the Colorado miners study, but still at levels high enough to observe consequent risks.) Nevertheless, the present program, from the standpoint of its contribution to science, needs a better balance between the studies of low-dose effects and other studies.

The scientific aspects of the present program are given breadth by the RERF studies in Japan that address both genetic and somatic endpoints. These studies are without doubt the most important and fruitful human studies concerning the effects of ionizing radiation that have ever been undertaken, and their continued support by DOE will no doubt prove to be rewarding. In the next few years the RERF studies of solid tumors will become increasingly informative, as the number of radiogenic cancers increases and the younger groups at the time of exposure to the bombs reach the ages of greatest cancer risk. Seventy percent of the population (all ages) was still alive in 1978. As the number of radiogenic cancers increases, it should be possible to learn much more about the role of not only age at exposure but also of sex, lifestyle factors, and other environmental risk factors in modifying the carcinogenic response to radiation. (The available number of radiogenic cancers is the limiting factor in such analyses.)

In the past, attempts were made at RERF to perform autopsies on all deceased members of the major study sample (Life Span Study Sample). The proportion of postmortem examinations among such persons decreased with time to a level where the autopsy subset was thought not to be representative of the larger group. For this and related reasons (including especially the attendant costs), the autopsy program was significantly reduced in scope in 1978. Recent events suggest that this issue should be re-examined with consideration given to the development of a highly focused autopsy program. Such a program would be structured around groups of individuals with disease entities or exposure histories that are thought to be unique and where the autopsy would be expected to add significantly to our understanding of one or more aspects of radiation injury, such as, persons exposed in utero and individuals with two or more suspected primary malignancies. As a next step, it might be appropriate to bring together a group of several pathologists with interests in radiation injury to discuss the feasibility and possible scope of such a program.

With reference to genetic epidemiology, OHER has a long record of support of studies of mutation in humans, primarily in connection with the program of RERF in Hiroshima and Nagasaki, Japan, but to a lesser extent, in the U.S. as well. Although the Japanese studies were originally morphological in nature, as new techniques became available, such as those of cytogenetics and one-dimensional electrophoresis, they have been introduced into Japan. These studies, which are the only really significant source of data on the genetic effects of radiation on humans, have yielded a very tentative estimate of the genetic doubling dose for mutations of about 160 rem of acute radiation. Genetic studies are about to enter a new and more promising phase as the newest techniques for studying proteins and DNA are implemented in Hiroshima and Nagasaki in the next several years.

However, all of radiation epidemiology cannot be built on the experience of the A-bomb survivors, valuable though it is. The complexity of radiation exposure, and the ways in which that complexity influences risk, are such that many other experiences need to be studied, experiences that provide clues, for example, to the influence of dose-rate and dose-fractionation, of high-LET radiation of different kinds, of internal emitters, and of partial-body exposure. Important insights into the mechanisms responsible for cancer may flow from more specific quantitative information on variation in the risk of radiogenic cancer associated with host and environmental characteristics. To study these sources of variation requires large numbers of radiogenic cancers, which are just not beginning to become available among the A-bomb survivors. A program of radiation epidemiology with scientific objectives should have such breadth.

The DOE program would benefit scientifically from a better balance between the low-dose studies and those aimed at an increased understanding of the sources of variation in the risk of radiogenic cancer. This might well take a larger commitment of resources, because the current surveillance of worker groups cannot be abandoned. However, it is possible that future efficiencies in the occupational study designs may also aid to a certain extent in freeing resources for new studies. (See Appendix D).

With regard to the studies of non-nuclear energy sources, the subcommittee consensus was that great care must be taken to assure that such studies have reliable measures of exposure levels and use "hard" health endpoints which are not readily subject to bias by extraneous factors. This concern arose in particular over questions about the OHER coal gasification study.

RECOMMENDATIONS

Recommendation 1:

Consonant with DOE's mission to develop and use nuclear and other energy technologies, OHER should assume a leadership role in the epidemiologic study of somatic and genetic health effects pertaining to ionizing radiation and other energy pollutants.

Clearly, DOE has a responsibility for the safety of its employees, a component of which is a health surveillance program to monitor for adverse health effects associated with such polluntants. For chronic diseases or adverse genetic effects, such surveillance requires systematic and broadly-based epidemiologic studies. At the same time, it is important to obtain the kinds of epidemiologic data that can make major scientific contributions to our understanding of the effects of radiation and other potential toxicants. Doing so will entail developing new targeted studies and broadening the information base in existing studies. The Department of Energy, should take the lead in anticipating human health consequences from the use of other sources of energy and in placing them in perspective with the health consequence of existing sources.

Recommendation 2:

Objectives for the DOE epidemiology program need clear formulation to serve as a measuring stick for all aspects of its research.

Upon specifying the objectives, the management of the program should develop criteria as to whether the studies are meeting those objectives.

This would serve both a program-evaluation and program-planning function, as it would help identify where there are over- or under-emphases in the program.

A question can be raised as to how clearly focused the studies are in conception and design and how responsive they are to potential uses. Are the study designs, choice of variables, data collection and proposed analyses being geared toward defining upper limits on risks, toward answering questions of whether there may be undue risks, associated with certain worksites, toward being responsive to needs with regard to present and impending litigation, etc.? The Subcommittee's sense for this is that, with further thought on the part of the managers and program directors, there could be some fine tuning of the studies to make them more responsive to the stated needs and goals.

In regard to ionizing radiation, the Subcommittee felt that the present program was narrowly focused in comparison with the breadth of the field of radiation epidemiology. Thus, the program planning should include a concerted effort to identify and address, where feasible, gaps that exist with respect to important unresolved issues in radioepidemiology. For example, relatively little is being done in the program to examine systematically the effects of dose-rate, host-susceptibility factors, or the possible interactive effects of exposure to multiple toxic agents (see also recommendation # 7).

Recommendation 3:

The DOE should institute management changes to improve the credibility of its epidemiology program among scientists and the public.

Measures that DOE might undertake to improve the credibility of the program include:

a. Institute a process of competitive bidding for new studies whenever possible and include proposals from outside of the Department of Energy laboratory system.

b. Provide for external review of all epidemiologic programs on a periodic basis (at least one review every three years) and include reviewers from outside the DOE system.

c. Provide funding within each epidemiology program for participation and training of university scientists and students. (The experience of the Radiation Effects Research Foundation could serve as a model.)

d. Make selected epidemiologic databases available to qualified scientists outside of the Department of Energy when appropriate, recognizing that both risks and benefits would result from such a policy.

Recommendation 4:

The DOE should devote more attention to the epidemiologic study of other potential toxic agents in addition to radiation.

A number of recent legislative and judicial developments have indicated a need for information on the joint effects of radiation plus other exposures. With exposures to combinations of agents, exposure control standards may or may not account for the total risk. This is an important industrial hygiene concern as well as a major stumbling block to resolution of injury litigations. Selective, targeted studies are clearly necessary, but since the numbers exposed to a particular toxic agent at a given DOE facility may be relatively small, the program managers would need to foster inter-facility studies and assure that data can be obtained in a uniform manner.

Programmatic emphasis should attach to studies that will develop methods of quantifying chemical exposures to workers. Hopefully, these methods can be validated and applied to other worker situations where only limited or indirect exposure information may be available. (See Appendix E).

It is also advantageous for OHER-DOE to coordinate their epidemiology and toxicology programs, so that, when good epidemiologic data become available on a particular toxic agent, animal bioassays and/or short-term tests (mutagenesis, cell transformation, etc.) be conducted as well. A series of these coordinated results would provide a linkage by which the experimental tests can be used for prediction of human health effects in the future.

A strong case can be made for collecting more and better information on smoking and other lifestyle factors in the DOE epidemiologic studies, insofar as it is feasible. It is currently uncertain whether risks associated with radiation or other toxicants may be modified by lifestyle factors, and there is a need to reduce such uncertainties. This issue is an important concern for reasons of both science and litigation.

However, a caveat needs to be added to this recommendation. It is important that the study of multiple toxicants and lifestyle factors not be allowed to detract from the quality and diversity of the main studies of radiation. The add-on studies of non-radiation factors will therefore have to be planned in a selective fashion.

Recommendation 5:

Steps should be taken to improve program coordination.

There are several ways in which intra- or inter-program coordination could be improved.

a. Although steps have been taken in the last two to three years to improve communication and coordination among the several groups of DOE epidemiologic investigators, further improvements could be instituted, such as having meetings of the study directors two or three times a year to discuss new findings and problems, review goals, etc.

b. It is particularly important to exert efforts to increase awareness among epidemiologists of concurrent work by toxicologists, radiobiologists, molecular biologists, etc., with the intent that (a) both groups of investigators keep abreast of important new findings and issues, and (b) they enhance their efforts to improve the extrapolation of results from experimental and animal systems to humans. This would provide verification of current scientific approaches for predicting health risks from exposure to toxic agents that are based upon laboratory animal studies or bioassays; it would supplement, but not exclude, other nonepidemiologic verifications such as comparison of effects on different species.

c. Since many of the questions of health risks in the workplace are ultimately addressed by epidemiologic studies, the epidemiology program managers and study leaders should enhance their working relationships with the occupational-safety, medical, health-physics and industrial-hygiene groups at DOE facilities to ensure that the record keeping is adequate for epidemiologic needs. The development of automated systems for collecting health and exposure information should be encouraged at DOE worksites. Systematic collection of lifestyle information such as histories of smoking, previous employment and medical exposures to radiation should also be encouraged.

d. A primary aim of the "low dose" occupational radiation studies is to provide the narrowest possible upper bounds on the estimates of health risks at low doses. In principle this goal is best served by having the largest available sample sizes. To this end, "pooled" or parallel analyses of the several low-dose datasets should yield a narrower upper bound on the range of risk(s) associated with low-dose radiation than is possible with any individual study. The subcommittee suggests constituting a task force composed of representatives from the studies and several outside statisticians, epidemiologists and dosimetrists to plan and oversee this effort.

Recommendation 6:

Provide strong support for the RERF studies of the A-bomb effects in Japan.

The Committee strongly endorses the RERF study as being a most important and productive human radiation study, and one that provides unique information. We believe it should be strongly supported for yet another twenty or more years, since the fruitfulness of the study is increasing over time.

Recommendation 7:

Initiate targeted studies to address gaps in our scientific knowledge.

The DOE should request and review new epidemiologic research proposals aimed at filling important gaps in our current approaches to occupational hygiene and risk assessment. Important information gaps currently exist in our approach to setting occupational exposure standards and evaluating worker health risks. We do not currently have:

a. Adequate information on health risks from exposures to combinations of radiation and chemically toxic substances.

b. Sufficient information on the importance of lifestyle factors (e.g. smoking and diet) in evaluating risks to workers in energy-related industries.

c. Information on dose-effect relationships for exposures to neutrons, and information on dose-rate effects for low-LET radiations.

d. Information on how background irradiation and medical radiation exposures may alter the putative occupational radiation dose-response curves. Statistical and methodologic studies are needed. (See Appendix C.)

e. Identification of sensitive subsets of human populations that may require special consideration when setting occupational exposure guidelines.

f. Evaluation of new techniques for quantifying and monitoring genetic risks in worker populations.

Recommendation 8:

The DOE should explore vigorously the potential of new approaches in genetic studies.

Recent developments with respect to protein chemistry, DNA technology, and the computer hardware and software available for the analysis of complex biological images open new possibilities for genetic studies of radiated populations. These emerging techniques have the merit of extracting far more information from a single individual than has been possible heretofore, important in view of the relatively small size of the human populations available for study and, at both the protein and DNA levels, permitting the use of homologous indicators in humans and mice, thus meeting some of the problems in extrapolation that have arisen in the past. Very recently, pilot studies with respect to the potential usefulness of the group of protein markers visualized with 2-dimensional polyacrylamide gel electrophoresis of blood samples have been introduced into the RERF program of genetic studies, and the need to proceed to the DNA level as rapidly as possible has been recognized.

New approaches in genetic studies should be explored not only in human populations but in a mouse model. A prompt evaluation of the usefulness of these approaches with a mouse model would not only validate (or refute) the investment in a human study but permit explorations of the nuances of the approaches which are not possible for potentially mutagenized human populations. It is further recommended that in any major new round of genetic studies, in the same populations of both humans and mice, indicators of genetic damage in somatic cells be pursued simultaneously, in order to begin to build the necessary bridges between somatic cell and germ cell studies.

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Appendix A

Excerpt from a Letter by Dr. Alvin Trivelpiece, Director of the Office of Energy Research, to the Health and Environmental Research Advisory Committee (HERAC), Requesting a Review of the OHER Epidemiology Program

> "OHER supports a number of studies in the area of epidemiology, including a long-term study of atomic bomb survivors in Japan which is carried out through the Radiation Effects Research Foundation (RERF). Although the individual projects have been peer-reviewed recently, there has been considerable ongoing discussion and attention devoted to some of the studies. Questions have been raised about the scientific value of some studies, and whether some were appropriate for DOE. Would you please assess the OHER epidemiology program and advise me on the need for and scientific merit of this work? Should these studies continue to be supported by DOE? Are there other energy-related human health issues which should receive higher priority? What directions should the RERF studies take in the future? Should support of this work be continued indefinitely? Are there other scientific approaches that should be employed in the RERF studies?"

APPENDIX B

DOE Health and Environmental Research Advisory Committee

Ad-hoc Subcommittee for Review of DOE Epidemiology Program

Dr. Roy E. Shore, Subcommittee Chairman
Associate Professor
Department of Environmental Medicine
New York University Medical Center

Dr. Robert E. Anderson
Professor and Chairman
Department of Pathology
University of New Mexico
  School of Medicine

Dr. Gilbert W. Beebe
Expert Scientist
Clinical Epidemiology Branch
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Dr. Patricia A. Buffler
Associate Dean for Research and
  Professor of Epidemiology
School of Public Health
University of Texas

Dr. Theodore Colton
Professor of Public Health
Epidemiology & Biostatistics Section
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Dr. Richard G. Cuddihy
Chief of Risk Assessment Group
Lovelace Inhalation Toxicology
  Research Institute

Dr. Robert Miller, Chief
Clinical Epidemiology Branch
National Cancer Institute-NIH

Dr. James V. Neel
Lee R. Dice University Professor
  of Human Genetics
University of Michigan
  School of Medicine

Dr. Richard Wilson, Professor
Department of Physics
Harvard University

Appendix C

BACKGROUND AND MEDICAL RADIATION EXPOSURE

Historically, studies of high-level exposures to ionizing radiation have not paid very much attention to factoring in background radiation and medical/dental diagnostic radiation exposures, because these were on average very small in comparison to the levels of exposures being studied. However, in the low-dose studies being conducted by DOE investigators, this is no longer true. The background and medical exposures may often equal or exceed the cumulative occupational exposure levels.

While recognizing that obtaining historical medical exposure information is much too costly and difficult to do on anything like a routine basis, it nevertheless behooves the program to mount some studies to evaluate the possible biasing or masking effects attributable to these other sources of exposure.

A start has already been made by the Hanford investigators (E. Gilbert) in modelling the possible effects of variations in background and medical exposures on a theoretical basis. However, it would seem appropriate for one or more special substudies to be done, wherein actual medical/background exposure data are gathered for an empirical evaluation of the potential biasing/masking effects of such exposures. This would provide a more realistic estimate of the magnitude of the variance of such exposures relative to occupational exposure levels, information on the shape of the distributions of such exposures for more realistic modeling, and a direct assessment of their potential for producing perturbations in low-dose studies.

Appendix D

EFFICIENT STUDY DESIGN

Although questions of long-term employee health surveillance suggest that total worker populations should be followed up in the studies at the DOE facilities, it would seem worth considering whether some efficiencies in study design could be implemented. In terms of the scientific yield of the studies, they are generally designed suboptimally, i.e., the vast bulk of the subjects have trivial or no radiation exposures, and a relatively small percent of the subjects contribute most of the collective person-rem in the study. (As one typical example, in the plutonium workers study, 1,025 workers who have ≥ 4 nCi depositions contribute half the total dose commitment of Pu among the 125,000 subjects in the study.) Little is to be gained in terms of statistical power by having the very large numbers of subjects at very low doses rather than a pared-down sample size there.

This subject merits some thought and discussion by the DOE management. Perhaps a two-tiered system of follow-up could be developed: a routine, less-costly level of follow-up of all workers for the purpose of health surveillance, and compilation of more detailed information only on strategic subsamples.

Appendix E

CONSIDERATIONS IN THE EPIDEMIOLOGIC ASSESSMENT OF CHEMICAL TOXICITIES

It is often suggested that exposure levels of workers can be categorized by composite indices based upon job classification, the amounts of chemicals used in a facility, and a general description of the procedures used by individual workers. However, this approach has not been rigorously validated. Valuable information could be obtained from many of the current studies involving uranium, plutonium, and other non-radioactive metals wherein bioassay information and job category information are both available. If general methods for developing exposure indices could be validated from these studies, they might well be applied to other important epidemiological studies where no exposure information currently exists. This would markedly enhance the value of many studies and should be given priority because none of the current epidemiology studies appear to adequately account for exposures to more than one type of toxic agent.

Although it is desirable to determine in the human studies whether there are interactions (synergistic or antagonistic) between radiation and other agents, it is not clear whether it will be feasible to do so in the context of the low-dose DOE studies. I.e., if one cannot see a radiation effect to begin with because of the low doses, could one expect to see, say, synergisms. Or conversely, if one does not find any interactions, how strong would such negative evidence be, given that the radiation effect is nearly undetectable?

DOE NOTICE

This report has been prepared as a part of the activities of the Department of Energy's Health and Environmental Research Advisory Committee, a public advisory group providing extramural scientific advice to the Secretary and other officials of the Department. The document has been published by Lawrence Livermore National Laboratory, Livermore, California for the Committee. The contents do not necessarily represent the views and policies of the Department of Energy or of the Laboratory.

PREPARED STATEMENT OF JOE LA GRONE

Dear Mr. Chairman:

My name is Joe La Grone. Since April 1983, I have been manager of Oak Ridge Operations of the Department of Energy (DOE). Prior to coming to Oak Ridge, I was manager of the San Francisco Operations Office.

I am pleased to have this opportunity to address the Committee's concerns as they relate to DOE's management of the health and safety programs at the Feed Materials Production Center (FMPC) in Fernald, Ohio. The FMPC is one of several Government-owned and contractor-operated facilities managed by the Department's Oak Ridge Operations Office.

Oak Ridge Operations

Oak Ridge Operations is one of the largest and most diversified of the DOE operations offices. It is involved in most of the major DOE mission activities which are supported, in part, by principal facilities and activities in Tennessee, Ohio, Kentucky, Louisiana, Texas, California, and Virginia. Oak Ridge Operations' broad range of responsibilities covers energy related research, development, production, and training functions and activities oriented toward DOE mission accomplishment in uranium enrichment, strategic petroleum reserve, defense programs, and the broader realm of energy research and development.

Oak Ridge Operations' programs and activities are conducted by approximately 24,000 scientists, technicians, craftsmen, and administrative personnel. Of these, only about 700 are Federal employees. Federal employees provide day-to-day policy, program, and functional direction.

The FY 1984 budget for Oak Ridge was $4.565 billion. The capital investment in facilities totals some $8.9 billion, and to replace them today would cost in excess of $20 billion.

Oak Ridge Operations is responsible for six broad mission areas. They are:

1. the production of enriched uranium for use in national defense programs, and for use in fueling nuclear power plants, in this country and abroad;
2. the production of components and subassemblies in support of the DOE nuclear weapons programs;
3. the processing of uranium feed materials and related production of uranium fuel cores for U.S. plutonium production reactors;
4. the conduct of a broad spectrum of research and development programs related to furthering the nation's energy well-being;
5. the storage of sufficient oil to provide a buffer to future market changes and assure the capability to deploy stored oil into the marketplace, when needed; and
6. the conduct of education and training programs serving public, professional and technical groups.

Oak Ridge Environmental Problems

In addition, Oak Ridge Operations executes contracts with many colleges, universities, and private organizations for conducting research, development and education programs.

As manager of Oak Ridge Operations, I firmly believe that every attempt must be made to insure the safe operation of DOE facilities under my control and to protect the health and safety of the plant workers and the public. After my arrival at Oak Ridge in late April 1983, I observed that environmental matters were receiving an increasing amount of attention from regulatory bodies. I learned that discussions were underway among personnel from Oak Ridge Operations, the U.S. Environmental Protection Agency (EPA), and the

State of Tennessee about conditions at the DOE Y-12 Plant, which were believed by the State and Federal regulatory agencies to be out of compliance with State and Federal regulations and standards. I was also informed of the mercury situation, and a 1977 report that was undergoing declassification review for public release. This report was prepared in 1977 as an accounting of the mercury inventory situation as it existed at the Y-12 Plant when large quantities of mercury were used in lithium separation for thermonuclear weapons. The report indicated that, during the period between 1950-1963, there had been spills and losses to the environment of about 650,000 pounds of mercury, and almost 2 million pounds of mercury was unaccounted for. This report was released on May 17, 1983, and received broad distribution followed by intense public scrutiny and concern.

After reading this report, I became convinced that sharper focus was needed on past and present environmental activities throughout the programs of Oak Ridge Operations. Therefore, on May 9, 1983, I established a 12-member multidisciplinary Oak Ridge Environmental Task Group. The charter of this group was to learn as much as possible about the Y-12 mercury situation, discern what potential problems were present, and offer proposed solutions. At its inception, I informed the task group that once the mercury situation was under control, the group was to expand its problem spotting and problem solving activities to the entire Y-12 Plant mission, and then as soon as reasonably feasible, expand its purview to other Oak Ridge Operations facilities, and ultimately to those plants located in other States for which Oak Ridge Operations is responsible. In my testimony before the Subcommittee on Investigations and Oversight, and the Subcommittee on Energy, Research and Production of the House Committee on Science and Technology on July 11, 1983, I discussed this Task Group and its continuing role in identifying problems within the Oak Ridge Operations facilities and my commitment to work diligently, with openness and candor, to identify and correct those problems and to bring our facilities into compliance with applicable standards. By conceding our shortcomings, demonstrating a willingness to aggressively address our problems and by working cooperatively with local, State, and Federal oversight and regulatory bodies, we have made significant progress.

In addition to the previously mentioned environmental problems at the Y-12 Plant, due to historical releases of mercury and archaic waste disposal practices, there was an immediate need throughout DOE to accelerate safeguards and security upgrades at sensitive facilities, such as the Oak Ridge Operations Y-12 Plant, which had not been sufficiently addressed for a number of years. These problems were in addition to the need to maintain the overall production schedules; address similar programmatic, environmental, and safeguards and security issues at the gaseous diffusion plants and Oak Ridge National Laboratory; assume a leadership role in the evolving strategy in the uranium enrichment program; and assuming in June 1983, responsibility for field oversight of the Strategic Petroleum Reserve Project Office, which included extensive efforts to strengthen the management (both Federal and contractor) as well as investigate all allegations of waste and fraud since inception of the project.

As unacceptable policies and practices, primarily at the Oak Ridge Reservation, were identified by the Oak Ridge Environmental Task Group, they had to receive early, priority attention. As these were addressed, we moved methodically to identify other facilities needing attention. One of these was the FMPC in Fernald, Ohio.

Task Force on FMPC Operations

On April 13, 1984, I established an Oak Ridge Task Force to review operations at the FMPC in order to begin to better understand the problems at the plant, and to begin to develop corrective plans, where necessary.

The charter of that Task Force was to assess the following areas:

1. Ability of the FMPC to operate reliably over the next 15 or 20 years at projected production levels, including current and planned restoration activities.

2. Environmental protection and waste disposal.

3. Fire protection and industrial safety.

4. Management commitment to aggressively implement required changes, including NLO, Inc. (NLO), staffing plans.

5. Need for permanent DOE staff on-site at the FMPC.

The FMPC began operation in the early 1950's as a large scale integrated production facility for processing uranium and its compounds from natural uranium ore concentrates. Today, recycled material is utilized as a feedstock for the facility. NLO operates the site as a prime contractor to DOE.

The principal product from the FMPC operations is high purity uranium metal in various physical forms having several standard isotopic assays. The primary mission is the production of depleted uranium target element cores for the DOE Savannah River Plant near Aiken, South Carolina, production reactors; low enriched machined ingots and billets for fabrication into fuel cores for the DOE N Reactor at Richland, Washington; and depleted uranium metal for DOE's Y-12 Plant in Oak Ridge, Tennessee, and the Rocky Flats Plant in Colorado.

Following the initial $117 million construction project, an approximate $60 million expansion occurred in the mid-1950's. Metal deliveries peaked in 1960 at approximately 10,000 metric tons of uranium and then in 1964, began to decline to a low in 1975 of about 1,230 metric tons of uranium. During the 1970's, consideration was given to closing the FMPC so capital improvements and staffing were minimized. The staffing level, which peaked at 2,891 in 1956, slowly declined over the same period to 538 in 1979. Then, in FY 1981, direction was given to plan the FMPC restoration to accommodate projected product requirements that were to grow to near the originally installed capacity of the facility.

This transition included significantly increased production levels, rapid staff buildups in many areas, and implementation of a major facilities restoration program. As of this date, accomplishments include: production output of 288 percent of the 1979 level; a staff increase from 538 to over 1,000; and the initiation of over $70 million of capital facility improvements.

During the past approximately 30 years of FMPC operation, uranium, through process losses, was released to the environment via both the air and water pathways. While a small percentage of total uranium throughput, the cumulative discharges are large when viewed independently. The major discharges occurred during the 1950's and 1960's, during the early years of plant operations. The total discharge to the air was 95,954 kilograms of uranium (Kg/U) and 74,308 Kg/U to the water. An additional 5,121,717 Kg/U was disposed of in onsite pits. Large volumes of contaminated scrap have also been sent to the FMPC for storage. There are also three concrete silos of dry waste at the FMPC. One silo contains low-radium metal oxides and the other two contain high-radium content uranium ore residues left over from material processed earlier at the FMPC or shipped from the Mallinkrodt Plant in St. Louis or the Niagara Falls site.

The Oak Ridge Task Force issued its report in June 1984, on the FMPC and identified both programmatic and attitudinal changes required by the operating contractor (NLO), and Oak Ridge Operations to both recognize and initiate action on environmental and other issues. This report was intended as a baseline for future actions, and the contractor was asked to develop a plan of action to deal with the recommendations.

The Task Force report was transmitted to the FMPC on September 27, 1984, and NLO provided an action plan to Oak Ridge Operations on October 31, 1984.

Investigation of Uranium Release at FMPC

On December 7, 1984, I was informed of a uranium release from the FMPC. Upon learning that the loss was reported to have occurred as a result of malfunction of the Plant 9 baghouse air filtration system from approximately mid-

September to December 6, 1984, I immediately ordered an investigation because the release was considered excessive for the operating period in question. The loss has been determined to have been 123.9 kilograms of slightly enriched uranium emitted from sometime after September 11, 1984, through the early morning of December 7, 1984. The Investigation Board was charged with assessing the situation at the FMPC and determining the causal factors which contributed significantly to the release.

Oak Ridge Operations reported the release to the National Response Center and the Ohio EPA on December 7, 1984, pursuant to the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act.

We also issued a press release that day to inform the public of the release. In response to public reaction and concern, several members of my staff went immediately to the FMPC and conducted a public meeting near the Plant on the evening of December 13, 1984, to benefit from face-to-face communication. The purpose of the meeting was to inform citizens near the Plant of the scope and extent of the DOE investigation and to better understand their concerns in order to be more responsive.

NLO, following the shutdown of the Plant 9 baghouse on December 7, 1984, undertook a number of corrective actions, including:

1. vacuum cleaning the baghouse;

2. replacing one bag;

3. installation of new gaskets on the units' access doors;

4. dye testing the system; and

5. conducting a 16-hour dry run.

Operations were restarted on December 12, and continued normally until the morning of December 14, when instrument readings indicated that the Plant 9 baghouse might again be malfunctioning. NLO responded immediately and shut the unit down. Analysis indicated that the uranium discharge had been very small. However, it was my judgment that this baghouse should not be restarted until an outside group of experts on air filtration systems could conduct a thorough review and provide a determination that the facility was adequate to operate. Again, the appropriate agencies were notified, and an onsite press conference was held to explain the latest problem on the day of its occurrence. We also took the press on a tour of Plant 9.

As a result of an intensive inspection of all major process ventilation systems at the FMPC, NLO made a decision to temporarily shutdown a portion of a second processing facility (Building 5) because of marginal performance of two of the facilities' bag filtration systems.

On December 18 and 19, 1984, the outside group of independent experts carried out an inspection of the FMPC major process ventilation systems. All "near-term" recommendations by these experts have been accomplished by NLO, and the FMPC was revisited to verify that all these recommendations have been met satisfactorily.

Because of the expressed concern from members of the community near the FMPC regarding possible internal contamination with uranium, Oak Ridge sent the Y-12 Plant in-vivo counter to the FMPC to respond to citizen requests, on a voluntary basis, for examination. I was advised by our technical staff that this counter offered the best means available to quickly determine if one had accumulated uranium in the body over an extended period. Approximately 80 members of the public were counted with no uranium found above what would be considered background levels. This mobile counter is routinely used at all Oak Ridge Operations facilities for counting of plant employees who work around uranium. Workers at the FMPC and employees of subcontractors were also counted while the van was at the FMPC. As a result of a review of the December release, the National Institute for Occupational Safety and Health

(NIOSH) recommended that four NLO employees be sent to DOE's Argonne National Laboratory for comparison whole body counting. The results obtained at Argonne were inconsistent with the uranium isotopes in use at the FMPC, and thus, the results are confusing. To clarify this inconsistency, NIOSH has suggested that these workers be sent to DOE's Battelle Northwest Laboratory for counting. DOE has recently been contacted by the staff of the University of Cincinnati Medical Center, who have offered the use of their whole body counter. In any event, whatever NIOSH determines, we are prepared to cooperate and support their efforts.

Report on Investigation of Uranium Release

On February 6, 1985, DOE issued its report on the "Investigation of September-December 1984, Plant 9 Excessive Uranium Emissions."

Following the receipt of the report, we briefed appropriate committee staff, held a press conference in Cincinnati, and a public meeting in the community near the FMPC.

The Investigation Report contained a number of recommendations, and I would like to review the actions we have taken.

1. All "near-term" recommendations by the outside experts have been accomplished. Action plans are being developed to implement "long-term" recommendations.

2. Key staff at the FMPC have been instructed on applicable reporting requirements of DOE and other Federal agencies. Their reporting to DOE and the public is timely and shows an increased sensitivity for the necessity of early and full disclosure. NLO has hired a public information specialist to assist in this critical area. Another DOE contractor, SAIC, is working to develop plans for a series of plant tours for employees and their families, and for the public in late Spring of 1985.

3. NLO is hiring an overall environmental manager and has made some staff changes and is aggressively recruiting to augment health physics capability. DOE is providing interim technical expertise from other contractor organizations to assist NLO in the interim.

4. Plant management has taken steps to improve the internal reporting system to insure that environment and worker health and safety concerns are brought directly to the Plant Manager's attention.

5. All Oak Ridge Operations contractors using baghouse filtration systems have been provided with the investigation findings and have reviewed their operations in recognition of the findings.

6. Oak Ridge Operations and NLO are identifying opportunities to upgrade uranium emission control technologies. We have accelerated the schedule for upgrading the Plant 9 dust collection system, including the addition of high efficiency filters. Other opportunities are anticipated in concert with the ongoing restoration program.

7. To provide better oversight and coordination, we have established a DOE site office at the FMPC. James A. Reafsnyder was selected in February 1985, to be site manager and is in residence at the plant. We have also recruited a second technical staff member and he will be joining Jim in early May. Through Oak Ridge Operations, Jim is drawing on the assistance of another member of our staff, detailed temporarily to the site office, while Jim gets a better feel for his overall staffing needs.

8. While we presently have two full-time DOE staff members onsite, the full resources of the Oak Ridge Operations staff are available through "Matrix" support to provide the expertise in various needed disciplines. I have stressed to the Oak Ridge Operations staff the high priority I place on the need for full, prompt response to site office requirements. Since arriving in Oak Ridge, we have increased the Environment, Safety, and Health staff in Oak Ridge Operations by about 25 percent, to be able to

respond to the major demands being placed on our technical staff in this area.

9. We are also making maximum use of other DOE contractors to provide technical assistance on a "quick turnaround" basis to NLO.

The investigation report issued on February 6 also found that the Oak Ridge contractor appraisal program had not been effective in identifying the principal cause factors leading to the release of uranium.

Contractor Appraisal Program

This is an area in which I had earlier felt needed improvement. As a result of becoming aware of the environmental problems in Oak Ridge, I established in August 1983, a committee to review the entire Oak Ridge Operations appraisal system. In July 1984, this committee issued its report and concluded that the existing contractor appraisal program was not identifying chronic or major problems to management early enough to avoid the potential for them to reach a crisis stage.

At the heart of any appraisal program are people who do the appraising. I have personally communicated to all Oak Ridge my expectations that more time will be spent by our appraisers in the plants and facilities for which we are responsible, not only to gain a better appreciation for the work being done, but also to see how well the work is being done and that it is being done safely, with concern for the environmental consequences, and with appropriate consideration of safeguards and security. Each employee has been encouraged to raise up problems and issues as soon as they are spotted and to let the necessary, but time consuming, paperwork and documentation follow.

The principal thrust of the new appraisal system is to quickly identify vulnerabilities and risks and to raise them to the appropriate management level in a more timely manner. Toward this end, steps have been taken to assure that managers fully understand their responsibility for health, safety, and environment.

I have also pointed out the need to the heads of all Oak Ridge Operations' major contractors, such as NLO, to strengthen their internal audit programs and to inform us of actions they have taken or plan to take, along with specific milestones for implementation.

Our whole new appraisal system is due to be in place by June 1985; and while we can expect some early problems with such a major change, I am convinced the long-term payoff is worth the effort.

Shortly after learning of the events surrounding the release at the FMPC, I wrote the Executive Vice President of NL Industries, Inc., the parent company of NLC, to express my deep concern that this event was not reported promptly to the public, regulatory bodies, or DOE.

Operating Contractor for FMPC

In subsequent discussions with NL Industries, Inc., I advised them of my decision to recommend to DOE, Headquarters, that the contract for operation of the FMPC be competed. Although the NLO contract for the management and operation of the FMPC had been previously approved for a 5-year extension, beginning October 1, 1985, it was my judgment that DOE should initiate a recompetition to include a wide participation of qualified organizations.

NL Industries, Inc., indicated that they would not be interested in competing for the new contract and agreed to DOE's desire for a 6-month extension of the present contract through March 31, 1986, to afford an effective, orderly transition to a new contractor operation by April 1, 1986. I appreciate the manner in which NL Industries, Inc., has responded and their pledge of full cooperation for the present and through the transition period. Since this is a major procurement action, a Source Evaluation Board was developed and a recommendation sent to DOE, Headquarters, on February 11, 1985. On March 1, 1985, the Source Selection Official designated a five-member board to select a contractor for the FMPC. A synopsis of the proposed contract award was published in the Commerce Business Daily on March 8, 1985. On March 11, we issued a news release outlining our plans.

On March 28, 1985, a presolicitation conference and tour was held at the FMPC. There were 77 persons from 34 organizations who participated in the tour and briefing. At the briefing, we indicated our expectations of the new contractor, in addition to achieving production goals:

1. Responsibility for construction of new and expanded facilities in an efficient and timely fashion.

2. The operation of the facility in an environmentally safe manner.

3. The development of a strong public information and community relations program.

4. Corporate backup in the areas of expertise represented by site operations.

The Request for Proposals is to be issued by April 30, 1985. A pre-proposal conference is scheduled at the FMPC on May 14 and 15, 1985. This will consist of a 1-day tour devoted to the closer inspection of the site and facilities and presentations the following day regarding the Request for Proposal and questions and answers. Proposals are expected to DOE on July 8, 1985.

I am pleased with efforts to date, and see no reason why we cannot meet the very tight schedule we have set for ourselves.

Cost-Plus-Award-Fee Contract

Following selection of a new contractor organization, we will negotiate a

5-year Cost-Plus-Award-Fee Contract. Under this type of contract, the Government pays for all legitimate costs incurred by the contractor in managing and operating the facility, then pays a fee to the organization commensurate with performance. First the agency establishes operational priorities of importance and monitors the contractor's level of performance in supporting these objectives to establish a level of fee. The Award Fee Plan of the new contractor will be better structured to emphasize the importance DOE is placing on the safety and environmental protection area.

While safety and environment has been assessed in the past under the NLO Award Fee Plan, the composite of evaluations, with greater weights for production activities, resulted in less than adequate visibility for this key operational area.

More specifically, in FY 1984, there were five functional areas assessed: (1) production operations; (2) safety and environmental control; (3) maintenance management; (4) budget; and (5) engineering.

The Award Fee Plan for the first half of FY 1985 retained the same five areas identified above and added three others: (1) safeguards and security; (2) small and disadvantaged business procurement; and (3) industrial relations.

In light of the excessive uranium emissions that occurred in the September-December 1984 timeframe, Oak Ridge Operations is determined that environmental matters should be given greater emphasis in the award fee structure than had been in the past; i.e., set it out as a separate item for evaluation rather than including it with safety. On December 18, 1984, NLO management was informed of the change which is in effect for the second half of FY 1985.

In retrospect, even though safety and environmental control was an area of evaluation in the past, management oversight of the FMPC would have been better served had Environmental Management and Protection been a separate area all along so that it would have received greater attention.

The overall Award Fee rating of excellent which NLO received for the first and second half of FY 1984, was due to the amount of weight assigned to production operations versus other areas. Obviously, we have learned from the experience. That is not to say that we intend to minimize the importance of producing acceptable products, but that we are also committed to achieving a better balance in the consideration of all the evaluation factors. To that end, we have adopted a new policy, whereby I and the Deputy Manager will meet face-to-face with the Award Fee Board and the Chairmen of the Performance Evaluation Committees to assure that appropriate consideration is given to each evaluation area.

Headquarters Review of FMPC

The problems at Fernald have elevated our need to pay more and better attention to not only environmental matters but also worker safety and working conditions. As a part of that, during the week of March 6, 1985, an 11-member health physics task force conducted a review of operations at the FMPC, as they relate primarily to worker health and safety. The task force was headed by the Director, Security and Quality Assessments, DOE, Headquarters. This group of experts reviewed operational health physics, including instrumentation, procedures, dosimetry, surface contamination, air sampling, staffing, recordkeeping, incident reporting, employee education and training, medical aspects, and environmental control of the workplace. Each of the recommendations will be implemented as quickly as possible.

Prior to this review, there had also been an onsite review by a staff member of the Headquarters Office of Nuclear Safety, and as a result of that review, it came to my attention that recycle material from another DOE facility was processed at the FMPC in 1982, with higher than normal levels of plutonium as a trace element contaminant. The recycle material at the FMPC normally contains less than 10 parts per billion plutonium.

However, in view of the fact that greater than 10 parts per billion plutonium material was processed in 1982, we have directed that only recycle material containing less than 10 parts per billion plutonium be processed pending the outcome of a study into current and past practices by a joint Oak Ridge Operations/Headquarters Task Force. The group will recommend maximum levels for processing recycle material at the FMPC and the Y-12 Plant. We expect to have a report from the group in approximately 45 days, and will provide it to the Committee when completed.

DOE has provided a rather large volume of information to Congress on various aspects of our current and past practices at the FMPC. I plan to continue to keep Congress, the residents in and around the FMPC, and the plant workers fully informed of actions that we are taking, as well as historical information which we turn up in our efforts to wrap around the problems at the FMPC. As an example, we recently provided a copy of an investigation report of release of uranium hexafluoride gas, which occurred on February 14, 1966. A copy of the press release dated February 14, 1966, which described this release was also included. The press release was not complete in that it only addressed the atmospheric impact of the uranium release. Data gathered subsequent to issuance of the press statement confirmed that discharge to water was the principal environmental pathway. The investigation report was dated March 16, 1966.

Update of Actions at FMPC

In addition to providing material that is developed on historical practices, I appreciate the opportunity afforded by this Hearing to report on some activities that have been initiated in the past several months that focus on the environment of the FMPC site:

1. We have negotiated a cooperative agreement with the Ohio Department of Health, whereby they will collect, analyze, and interpret drinking water samples collected from any resident of the plant area who requests this

analysis. They are also monitoring other private water supplies, and their sampling can be expanded, as desired, to include other environmental media such as soil, vegetation, and foodstuffs. Although DOE reimburses the State for most of the work related to this analysis, the interpretation is provided to the resident directly by the State.

2. An Oak Ridge contractor, Oak Ridge Associated Universities, is conducting an evaluation of onsite point of release monitoring as well as the onsite and offsite monitoring program currently in place, and has been asked to offer recommendations on how and where there can be improvements. One early recommendation was to use air monitoring equipment similar to that in use at DOE's Portsmouth Gaseous Diffusion Plant. NLO has already obtained the specifications for this equipment from Portsmouth and is procuring equipment for locations recommended by Oak Ridge Associated Universities.

3. During the week of April 21, 1985, the DOE Aerial Measuring Systems helicopter will begin a 2-week survey of the FMPC and the surrounding area to determine the kinds and levels of radioactivity present, including naturally occurring background radiation. The aerial survey will supplement an accelerated effort to obtain additional environmental data around the plant site.

4. By two letters dated December 18, 1984, the Ohio Attorney General notified the Secretary of Energy and the NLO Plant Manager of the State's intention to sue the Department over violations of the Clean Water Act and violations of the Resource Conservation and Recovery Act and the Solid Waste Disposal Act. All violations cited by the Ohio Attorney General related to activities at the FMPC.

   Meetings were held in Columbus on February 5 and March 19, 1985, with representatives of the Attorney General's Office and the Ohio EPA. During the February 5 meeting, DOE and NLO responded in detail to each of the allegations in the Notices of Intent to Sue. The responses included descriptions of how NLO was either in substantive compliance or how NLO was bringing itself into substantive compliance.

At the conclusion of the February 5, meeting, the State, NLO, and DOE representatives agreed to exchange documents dealing with environmental reports, chemical assays and constituent formats, and other more general environmental information.

The March 29 meeting was convened to discuss and answer questions raised by the State personnel arising out of their document review. Additional documentation was provided at the meeting or promised by NLO. Another meeting was tentatively set for mid-May.

5. On March 9, 1985, Region V of the U.S. EPA informed Oak Ridge Operations of the results of their review of the environmental impacts associated with operations at the FMPC. The following concerns were expressed by the U.S. EPA:

   a. The radiation monitoring program is inadequate.

   b. There have been incidents of radioactive air emissions due to unsatisfactory operation and maintenance of control equipment.

   c. The groundwater monitoring plan prepared by Dames and Moore for the FMPC is inadequate.

   d. There is a possibility that individual, noncommunity, and community drinking water supplies have been contaminated.

   e. The National Pollutant Discharge Elimination System permit monitoring requirements do not reflect the potential for discharge of radionuclides and other chemicals.

In response to the U.S. EPA role as technical advisor to assist Federal agencies to achieve compliance, I wrote the Regional Administrator on March 15, and informed him of my personal commitment to correcting the situation at the FMPC. My letter, which I would like to submit for the record, indicated that Oak Ridge Operations has been previously faced with major environmental problems in connection with operations at the Y-12 Plant and the Oak Ridge National Laboratory. Region IV of the U.S. EPA has been extremely helpful to us in dealing with our problems, and so has the State of Tennessee. It is my intent that Oak Ridge achieve the same kind of working relationship with Region V and the State of Ohio in defining and addressing environmental and related problems at the FMPC.

Our first meeting with Region V on April 2, 1985, and our meetings with the State of Ohio, have, in my judgment, been important steps in establishing the basis for the open, candid and constructive manner Oak Ridge plans to bring to all our dealings with the U.S. EPA and the State of Ohio.

6. Oak Ridge Operations is committed to developing an Environmental Program Management Plan for the FMPC similar to the study for the Oak Ridge Reservation, dated February 29, 1984, and was submitted to the House Science and Technology Committee.

   It is anticipated that the FMPC Plan will include:

   a. an environmental planning basis;

   b. a description of the problems and proposed resolutions; and

   c. funding schedules summaries.

   The planning basis will provide the foundation for identifying and characterizing the environmental problems and their potential resolutions. Using the planning basis, the environmental problems and resolutions will be identified by category. The categories will be: (1) radioactive waste; (2) hazardous waste; (3) co-contaminated waste (hazardous and radioactive contaminated); (4) conventional waste; (5) monitoring; and (6) remedial actions (i.e., waste pits, silos, scrap metal). The first five of these deal with current waste management practices, while the sixth is related to past practices. In general, resolutions to environmental problems associated with current waste management practices can be planned and scheduled.

Problems associated with past waste management practices, on the other hand, are more difficult to define and resolve, are dependent on extensive field testing and monitoring to determine bounds, and may require research, development, and demonstration to identify appropriate solutions.

Our present efforts are to assure that all the studies underway or planned at the FMPC are coordinated through the site office to provide an adequate basis for developing the FMPC Environmental Program Management Plan.

Based on experience with the Oak Ridge Reservation Plan, I would anticipate that it will require at least 6 months to 1 year to develop the Plan since a lot of the information needed is just being developed.

Conclusion

Admittedly, we still have a long way to go in solving our problems at the FMPC. Even though we are dealing with a 30-year old plant, we cannot allow past practices to continue. This is 1985, and we are working diligently, with openness and candor, to identify and control those problems and to assure that the FMPC is in compliance with applicable standards. Beyond that, we must and we will do a better job of providing oversight of plant operations and executing our responsibilities.

By working together, I believe we will be successful in these endeavors. Finally, I fully realize that Congress, the public, and plant workers are expecting us to perform and that words of assurance and rhetoric are not solutions. I can assure you that Secretary Herrington fully agrees with this statement. To that end, the Administration pledges cooperation, collaboration, and personal commitment to undertake the necessary actions.

DOE RESPONSES TO WRITTEN QUESTIONS

1. **Why have all DOE's major investigative activities with regard to the Fernald Plant been carried out by the Weapons Division instead of the Safety and Environmental Control Branch? after the November uranium releases.**

Answer: No major investigative activities, with regard to the Feed Materials Production Center (FMPC), have been carried out by the Weapons Division. The "Investigation of September-December 1984 - Excessive Uranium Emissions - Feed Materials Production Center," was conducted by a Department of Energy (DOE) Oak Ridge Operations Office (OR) Incident Investigation Board. The letter appointing Mr. John R. Martin of the Health Protection Branch, Safety, and Environmental Control Division, as Chairman of the Investigation Board is contained in the Investigation Report on page A-1. The other members were Mr. Pat Slattery of the Quality and Reliability Division and Mr. Gabe Marciante, of the Weapons Division.

The "Task Force Report on Review of Operations at the Feed Materials Production Center," dated June 1984, was chaired by Mr. George Benedict, Office of the Assistant Manager for Construction and Engineering. The names of the other members of the Task Force are contained on the inside front page behind the cover of the report. None were from the Weapons Division. Formal correspondence between OR and NLO, Inc., flows from the Contracting Officer's Representative, who was the Director, Weapons Division, to the FMPC Plant Manager. With the assignment of Mr. Jim Reafsnyder to the FMPC DOE site office in February 1985, Contracting Officer Representative responsibility was transferred from Weapons Division to Mr. Reafsnyder who reports directly to the Assistant Manager for Defense Programs.

2. From 1977 to present there have been a number of reports prepared by the Comptroller General which are highly critical of DOE health and safety practices. Have the recommendations of these various reports been implemented to date?

Answer: Since 1977, there have been a total of eight (8) General Accounting Office (GAO) reports which dealt with Department of Energy (DOE) health and safety problems and practices. The disposition of these reports has been as follows:

1. "Areas Around Nuclear Facilities Should Be Better Prepared for Radiological Emergencies," EMD 78-110, dated March 3, 1979. Shortly after this investigation, FEMA promulgated a set of regulations which DOE adopted. By following these regulations, DOE implemented the GAO recommendations.

2. "The Energy Department's Office of Environment Does Not Have a Large Role in Decision Making," EMD-80-50, dated January 29, 1980. The Department concurred with the two recommendations in this report, and all commitments made are closed out.

3. "DOE's Safety and Health Program for Enrichment Plant Workers is not Adequately Implemented," EMD-80-78, dated July 11, 1980. The two recommendations directed to the DOE were implemented. A third recommendation was directed to Congress.

4. "Better Oversight Needed for Safety and Health Activities at DOE's Nuclear Facilities," EMD-81-108, dated August 4, 1981. In its response, DOE disputed the need for the actions recommended by the

GAO and, therefore, did not commit to implement any recommendations.

Subsequently, two supplementary reports were issued on this same subject, EMD-81-108s and EMD-82-36, but no new recommendations were made, and no further response was necessary.

5. "Make Your Decision on Safety Criteria Before Constructing Facilities," C-MASAD-82-21. The one recommendation in this classified report was implemented.

6. "Decommissioning Retired Nuclear Reactors at the Hanford Reservation," RCED-83-104. There were no recommendations in this report, and no reply was necessary.

7. "DOE's Safety and Health Oversight Program at Nuclear Facilities Could be Strengthened," RCED-84-50, dated November 30, 1983. This report did not make specific recommendations so no response to Congress was required.

8. "Department of Energy Acting to Control Hazardous Waste at Its Savannah River Nuclear Facility," RCED-85-23, dated November 21, 1984. There were no recommendations.

3. Why doesn't DOE have an occupational standard for maximum allowable amounts of uranium in urine?

Answer: Consistent with the recommendations of the International Commission on Radiological Protection, the Department of Energy has occupational standards that limit the annual radiation dose to the whole body and to individual organs in which radioactive materials may deposit. Due to gross variations in individual metabolism, a standard based on allowable concentrations in urine alone is not as meaningful as standards based on dose to an organ. In the case of uranium, these standards have been designed to protect the worker from both chemical and radiological hazards of uranium. Measurement of the concentration of uranium in urine along with lung and whole body counting is used to assess dose and determine that these standards have been met.

4. Why doesn't DOE have a monitoring or record keeping program for non-radioactive toxic chemical exposure?

Answer: Department of Energy (DOE) policy requires monitoring for non-radioactive toxic chemicals. Order 5483.1A (6/22/83), requires "government-owned contractor-operated" (GOCO) contractors to:

"(b) Establish and implement programs and procedures in support of this Order which assure that:

"(4) The workplace is monitored for, and records maintained of, known toxic substances and harmful physical agents which are used or produced at the GOCO facility."

Further, DOE 5480.1A, Chapter X, Industrial Hygiene Program requires:
"(a) The results of air samples or other environmental monitoring shall be documented in a manner that can be audited, that is directly comparable to the applicable standards, and which can reasonably be associated with an individual, a particular job station, or a job description.

(b) The industrial hygiene staff's evaluation as to compliance or non-compliance with the standard applicable to a particular situation shall be clearly evident in the record. Actions taken on his part in the event of noncompliance shall be included. The affected employees shall be notified promptly of any exposures or potential exposures exceeding the standards of Chapter I of this Order."

Thus, the DOE requires that a monitoring program and a recordkeeping program be in place at each GOCO facility.

5. Do DOE's standards for uranium exposure differ from similar standards promulgated by other agencies such as NRC and EPA?

Answer: For members of the public, the Department of Energy (DOE) standards have been consistent with those of the Environmental Protection Agency (EPA) and with the recommendations of the International Council on Radiation Protection and the National Commission on Radiation Protection (NCRP). In September 1984, NCRP recommended to regulatory agencies, a whole body dose equivalent limit of 100 millirem per year, with provisions to control individual emission sources. This recommendation has been adopted by EPA under Section 112 of the Clean Air Act. DOE is committed to complying with this standard and believes its facilities do comply. Standards for uranium exposure of occupational workers do not significantly differ from those imposed by the Nuclear Regulatory Commission.

6. Does DOE have any system for informing the subjects of its human studies either of the fact that they are being studied or of the preliminary or final results of the studies?

Answer: Epidemiological studies do not involve experimentation with human subjects. Rather, information on employment history, demographic characteristics, and vital status is obtained from records kept at the facility under study or from State and Federal agencies. Thus, the management of the facility under study is aware that a study is being undertaken, and as the study progresses, the management is kept informed of the project's status. When results are available, usually several years after initiation of the study, scientific papers are submitted to peer-refereed journals for publication.

In late 1984, a program was established at Oak Ridge to inform study subjects directly about results, their possible interpretations, and their implications. The results are written up in language understandable to the lay reader. Open meetings are scheduled with workers and other interested parties, and the investigators attempt to answer all questions raised by the audience. For those who cannot attend the meeting, a telephone number has been announced whereby a subject may call the investigators directly to discuss any study. This system is now being supplemented with the development of a newsletter to be distributed by management during the course of a study in order to keep all workers informed on the progress of the investigation. This pilot program is being evaluated for expansion to other Department of Energy sites.

7. Does DOE maintain an active system for acquiring tissue samples, organs, or whole bodies of workers for research purposes?

Answer: The Department of Energy (DOE) does maintain an active system for acquiring tissue samples, organs, or whole bodies of workers for research purposes. The system, operated under contract to DOE by the Hanford Environmental Health Foundation, with assistance from scientists at the Los Alamos National Laboratory and the Pacific Northwest Laboratory, comprises the U.S. Transuranium Registries, established in 1968, and the Uranium Registry established in 1970. The purpose of these Registrys is to obtain improved understanding of the biokinetics and dosimetry of the transuranic and uranic elements in humans and to provide basic scientific data for radiation protection standards.

8. What is DOE's timetable and procedures for characterizing and cleaning up waste pits and silos?

Answer: Studies are underway by Dames and Moore. Additional efforts will be started in FY 1985 to characterize the waste pits and silos. Dames and Moore is making measurements to determine the source(s) of offsite uranium contamination in the groundwater. This study is considering potential sources including the pits, silos, liquid effluents, and deposition from air emissions. After identifying the source(s), corrective actions will be recommended by Dames and Moore. A more detailed study to characterize the pits and silos and to determine the extent of groundwater contamination from them, if any, is being planned. The characterization study is scheduled to begin this year. This study will be followed by an assessment of appropriate corrective alternatives.

9. How does DOE intend to clean up the three wells which have uranium in them?

Answer: The Dames and Moore effort will include recommendations for short-term and long-term corrective measures for the three wells. Based on these recommendations, the Department of Energy (DOE) will make decisions concerning the appropriate corrective actions for the wells. A concomitant priority, of course, is to determine the source(s) of uranium in the wells, and effect remedial actions to see that the source is controlled.

10. When is the Dames and Moore report due? What information do you expect to receive from it?

Answer: The Dames and Moore study is scheduled to be completed in final draft form by July 1985. The study will identify potential sources of uranium contamination in groundwater and recommend corrective actions, if necessary. The recommendations will include the offsite wells with uranium contamination.

11. What resources are required to perform characterization of waste at Fernald in terms of money and people?

Answer: It is estimated that the characterization study will cost $1,700,000. The study will be performed by a contractor with experience in this area, who will be selected soon. This study will require about 10 person-years of effort.

12. How does DOE intend to deal with the Radon in silos?

    Answer: The Department of Energy (DOE) is evaluating methods to reduce radon emissions from the silos until a final disposal method for the stored residues is determined. Potential short-term corrective actions to reduce radon emissions include, sealing the top of the silos, adding clay or concrete inside the silos, covering the silos with clay, or replacing the tops of the silos. Before an alternative can be selected, the structural stability of the silos must be determined. A contract to determine the structural stability of the silos is to be awarded in July 1985. Radon emissions from the silos are routinely measured, and an air monitoring system is in operation. The radon emissions data and air monitoring data will enable DOE to evaluate the effectiveness of any corrective actions. Final disposal options for the stored residues will be determined in the alternatives assessment described under Question 8. Studies indicate that radon concentrations at the Feed Materials Production Center site boundry are well below permissible limits.

13. What are DOE's plans for ultimate disposal of the waste?

    Answer: The Department of Energy's plans for ultimate disposal of the Fernald waste will be based on the results of the characterization studies and alternatives evaluations ongoing or planned for the next 2 years, including appropriate environmental review. Disposal options range from stabilizing the waste in place to exhuming the waste and transferring it to another site for disposal. Disposal options cannot be prudently selected until the results of the ongoing and planned efforts are obtained and evaluated.

14. Who is responsible for public information concerning health and safety hazards at Fernald?

Answer: Contractors who operate facilities for the Department of Energy (DOE) are expected to have public information programs in place to cover all aspects of operations, consistent with DOE Orders requiring such programs.

DOE is responsible for assuring that the contractor performs this function in a timely and effective manner. The decision on the extent of public dissemination is the responsibility of DOE. Some incidents or accidents could require the contractor to take immediate and independent action to inform local agencies and the general public to protect public health and safety.

15. Why hasn't the surrounding community, whose land, water, and vegetables have been examined by DOE, not received the results?

Answer: In the past, the Environmental Monitoring Annual Report for the Feed Materials Production Center (FMPC) has been provided to the U.S. Environmental Protection Agency (EPA) Region V, Ohio EPA, Ohio Department of Health, and the Board of Trustees of Crosby and Ross Township. Beginning in 1981, sampling of offsite wells has resulted in the identification of three wells with above background levels of uranium. These results were provided to the well owners and the Ohio Department of Health.

In response to concerns raised as a result of the Plant 9 dust collector failure, there has been a renewed interest in the surrounding community about uranium in drinking water. In response to this concern, the Department of Energy (DOE) entered into a cooperative agreement with the Ohio Department of Health that provides for the Agency to respond directly to citizen's request for sampling of drinking water, to analyze the samples, and to report back to the citizens on the results of the analyses. The reports are provided directly to the residents by the Ohio Department of Health.

Results of well sampling by NLO, Inc., are now provided to the tenants who may use water from wells that have been part of the ongoing program, but in which previously, only the well owner was notified of the results.

In order to provide a central location where copies of all reports, press releases, results of analyses, and any other information bearing on FMPC operations can be reviewed by members of the public, DOE has opened a public document area at the FMPC and the Lane Public Library, North Third and Buckeye Streets, Hamilton, Ohio.

In addition, the mailing list for the Environmental Monitoring Annual Report has been expanded to include, in addition to Federal, State, and County regulatory groups, all area media and citizens who have asked for copies. A press release announcing the availability of the annual report will also be issued indicating that a copy will be mailed to anyone who requests it.

An aerial radiological survey was conducted of the ground surrounding the FMPC in April 1985. When the survey team completes its analysis in early July, a public meeting will be scheduled in the community to present the findings and answer questions about the survey and the results.

16. Who will be responsible for the remaining environmental cleanup after NLO leaves?

Answer: The Feed Materials Production Center (FMPC) is a government-owned facility operated for the Department of Energy (DOE) by a private contractor, NLO, Inc. (NLO). A change in contractor does not change DOE's responsibility for the facility.

The process for selecting a new contractor is underway with April 1, 1986, as the target date for assumption of contract responsibility by the new contractor. The new contract will be a cost-plus-award fee arrangement for a term of 10 years (including a 5-year option). As operator of the FMPC, the new contractor will perform environmental cleanup activities as authorized/funded by DOE. The award fee plan for the new contractor will place greater emphasis on safety and environmental protection.

17. The DOE investigation of the last year's releases document that at one point the alarm sensitivity of the geiger counter keeping track of releases through the stack was decreased by a factor 10 so that it would not sound. In an interview with a National Public Radio reporter, a maintenance worker quoted a foreman as saying that, "I am told to silence the alarm and go on." Would you tell us what DOE's attitude is concerning the practice of silencing an alarm that is indicating possible radioactive releases to the environment and continuing to operate without a clear understanding of what is causing the alarms to go off?

Answer: In response to the Department of Energy Investigation Board's findings and the recommendations by the outside experts, NLO, Inc., has made the following changes in the stack radiation monitoring system:

1. Separate vacuum pumps have been installed on all Feed Materials Production Center stack sampling systems to assure uniformity of flow across the samplers independent of other operating conditions.
2. Emergency shutdown procedures are posted at dust collector panels.
3. The Ludlum Rate Meters are enclosed to prevent tampering with scale settings. Adjustments can be made only by instrument technicians or by IH&R staff members.
4. New operating procedures have been written.
5. Operators have been familiarized with the new operating procedures.
6. Ludlum instruments are tied to the adjacent panel alarms which can be heard in the industrial environment.

These changes were completed prior to startup of Plants 5 and 9, and were reviewed by the Investigation Board and outside experts. These changes are expected to prevent a reoccurrence of tampering with scale settings.

18. Page 15 of Mr. La Grone's testimony says that only recycled material containing less than 10 parts per billion plutonium will be processed at the FMPC pending the outcome of a study into current and past practices by a joint Oak Ridge Operations/Headquarters Task Force. I have asked for information on the levels of plutonium which have been processed in years past and have received only partial information. When will we receive a full report on the processing of such material at the FMPC? What is the highest degree of enrichment of uranium that has been processed at the FMPC since its opening 30 years ago? What is the maximum level of plutonium concentration in materials that have been processed at the FMPC and what is the threshhold level at which workers must take special precautions in dealing with the material?

Answer: A report by the joint Oak Ridge Operations Office/Headquarters Task Force should be completed in early July 1985. This group has been reviewing all the records regarding transuranics contained in material sent to the Feed Materials Production Center (FMPC) and to recommend maximum levels for processing recycle material at the FMPC and the Y-12 Plant. The highest uranium enrichment processed at FMPC was less than 20 percent, with the bulk being 2 percent. The other requested information is being developed and will be included in the Task Force Report. A copy of the Task Force Report will be provided the Committee when it is completed.

19. The Task Force Report stated on page eight, that the health and safety program at NLO "has always provided adequate protection of the employees and that the improvements are mainly in the realm of program refinement, documentation, and implementation of the ALARA principle for health protection." On what basis did DOE conclude that employees have received adequate protection? Isn't the entire point of ALARA that we really do not know precisely what the risks are with respect to low-level ionizing radiation and that, therefore, it is prudent to keep exposures as low as reasonably achievable?

Answer: The conclusion in the Task Force Report is based on the fact that worker exposures at the Feed Materials Production Center (FMPC) are being maintained well below occupational radiation exposure limits.

With regard to as-low-as-reasonable-achievable (ALARA), a basic principle of radiation protection has always been that, since the standards are based on the assumption that effect is proportionate to dose, exposures should be maintained "as low as practicable." This basic concept assumes that there will be a balancing of risks and benefits in all exposure situations. Occupational exposure standards are higher than for the general population. They take into account the more radiation-sensitive members of the population (i.e., workers under 18 or pregnant workers are restricted from areas where exposure is possible). Because of the confusion which has surrounded the intent of the "as low as practicable" concept, the International Commission on Radiological Protection introduced the concept of "as-low-as-reasonably-achievable" and expanded its recommendation to identify two specific considerations, namely, economic and social, that were to be taken into account in determining a level of exposure that may be considered "as-low-as-is-reasonably-achievable."

Thus, ALARA is a statement of philosophy of radiation protection. That is, while there are radiation protection guides or dose limits, exposures within the guides are to be kept "as low as is reasonably achievable." In other words, where exposures can be reduced by reasonable means, they should be reduced. By the same token, extraordinary efforts to bring about small reductions in exposure are not reasonable and not required.

20. In the Semi-Annual Appraisal of NLO Safety and Environmental Control Program on October 25, 1979, in connection with the award fee provisions of the contract, the Performance Evaluation Committee stated: "The sustained upper range 'excellent' rating (for health protection) is based upon improvements in the health physical ALAP (As Low As Possible) Program initiated during the reporting period...." Almost exactly one year later DOE's Annual Health Physics Appraisal of NLO dated October 7-10, 1980, had this to say about NLO performance: "The overall performance objective is to conduct an effective, efficient health physics program in accordance with DOE regulations and good health physics practices. This objective is not being met as is evidenced by the large number of recommendations covering deficiencies in many critical program areas. These appear to be the result of lack of sufficient management support and attention to the program. The Appraisal Team is concerned that maintenance of exposures within standards cannot be assured, ALARA notwithstanding."

The report goes on to say that there were high extremity exposures occurring within the facility, that recommendations were made in 1980 that were recognized as needs as early as 1977 indicating that a serious commitment toward improvement had not been made, that NLO was relying upon bioassay data to provide an indication of acceptability of control programs even though this was inadequate and can result in employees receiving exposures exceeding standards before such exposures are detected, and that there was no operating alpha instrument available when requested by the appraisal team during its visit to the plant. In addition to all this, there was no monitoring of recycled respirators, nor laundried work clothing, and "hot-spots" had recently been found on clothing and gloves after cleaning.

How is it possible for two such widely differing reports on NLO performance to be made by professionals at Oak Ridge, and why is it that the Report which gave the good rating was the one that was used for purposes of determining the amount of award fee?

Answer: The semiannual appraisal of NLO, Inc. (NLO), Safety and Environmental Control Program, dated October 25, 1979, for the second half 1979 award fee rated Health Protection "upper range excellent." This rating was based on improvements in the health physics ALAP (As Low As Practicable) program initiated during the reporting period. This rating was based on the successful application of ALAP concepts to the relocation of Thorium from Youngsville, North Carolina, to the Feed

Materials Production Center (FMPC). This transfer consisted of 5,600 drums containing 2,500,000 pounds of Thorium compounds.

The onsite Department of Energy (DOE) Health Physics Annual Appraisal of NLO dated October 7-10, 1980, pointed out numerous areas needing improvement. This appraisal was conducted a year after the Award Fee for the second half of 1979 report discussed above, and thus, could not have been considered in the second half of 1979 award fee.

21. NLO is required to report to DOE any NPDES non-compliances. Approximately how many such non-compliance notices did DOE receive during 1984?

Answer: NLO, Inc. (NLO), reports National Pollution Elimination System Discharge (NPDES) deviations by telephone to the Department of Energy (DOE), Oak Ridge Safety and Environmental Control Division with a followup written report to the DOE Contracting Officer Representative. During CY 1984, NLO, Inc., reported 35 deviations to the DOE Oak Ridge Operations Office. These deviations represent minor departures from the limits set forth in a water discharge permit originally issued by the U.S. Environmental Protection Agency and currently administered by the State of Ohio Environmental Protection Agency.

22. The Task Force Report says that originally air discharge permits for many of the emissions sources were not applied for by NLO as the result of an understanding with DOE that NLO was exempt from state air regulations covering mixed effluents. Then it says that DOE's position has changed and NLO is attempting to acquire permits for all applicable sources. What changed DOE's position? How many permit applications will NLO need to be in compliance?

Answer: Prior to 1977, Federal facilities were exempt from the provision of the Clear Air Act. With the inclusion of Federal facilities in 1977, applications for nonradiological emission sources were submitted by the Department of Energy (DOE) to the Southwestern Ohio Air Pollution Control Agency. The original permit applications were for stacks. However, the Southwestern Ohio Air Pollution Control Agency has advised DOE that under Ohio law, every source must be permitted, not just stacks. DOE submitted a number of permit applications in 1979. These applications were not acted upon. Recently, the Ohio EPA has asked that air permit applications be resubmitted. Such applications (between 500-600 applications) are currently being provided to the State in accordance with an agreed-to schedule.

23. Section F, page two, of the Objectives and Performance Criteria for NLO, Incorporated, FY '85, lists as an objective, "To conduct an effective, and efficient health physics program in accordance with DOE requirements."

The associated missions performance criterion is to, "assure occupational radiation exposures are maintained as low as reasonably achievable and within the standards obtained in DOE order 5480.1A, Chapter XI."

This objective was not met by NLO. For example,

1) In the last paragraph of page 31 of the Task Force Report on Review of Operations at FMPC, June 1984, there is a statement that shows that "ALARA" is not being achieved with respect to Fernald workers.

2) On Page six of the Incidence Investigation Board Report on the September-December 1984 Plant Nine Uranium emissions, there is the following statement: "NLO does not have an effective program from which to closely monitor and control uranium emissions to as low as reasonably achievable (ALARA)."

3) Page 37 of the same document: "NLO Industrial Health and Radiation Department staff were not acquainted with requirement to have an active ALARA program to manage emissions during the course of the year."

Despite this, and despite the fact that the award fee letter from Mr. La Grone to Mr. Montanari, dated May 23, 1984, recognized the ALARA practices were not being followed, a large award fee was nonetheless given to NLO along with an "excellent" rating on performance. What is DOE doing to prevent this situation from occurring in the future?

Answer: As Mr. La Grone indicated in his testimony, this is an area which needs improvement and where changes have been implemented. One key to an effective award fee program is a strong appraisal program. In August 1983, the Manager, Oak Ridge Operations Office (OR) appointed a committee to review the entire OR appraisal system.

In July 1984, this committee issued its report and concluded that the existing contractor appraisal program was not identifying chronic or major problems to management early enough to avoid the potential for them to reach a crisis stage.

All members of OR have been made aware of the Manager's expectations that more time will be spent by appraisers in the plants and facilities for which OR has oversight responsibility. This will enable the appraisers to gain a better understanding of the work being done there, as well as to see how well the work is being done and that it is being done safely, with concern for the environmental consequences and with appropriate consideration of safeguards and security. Each employee has been encouraged to point out problems and issues as soon as they are spotted with the necessary, but time-consuming paperwork and documentation following later.

The principal thrust of the new appraisal system is to quickly identify vulnerabilities and risks and to raise them to the appropriate management level in a more timely manner.

The new appraisal system for OR was put in place in June 1985 and has included training for all appraisers.

Under the NLO Award Fee Plan, the composite of evaluations, with greater weights for production activities, resulted in less than adequate visibility for safety and environmental protection.

The Award Fee Plan for the first half of FY 1985 contained five functional areas: production operations, safety and environmental control, maintenance management, budget, and engineering. To this was added safeguards and security, small and disadvantaged business, and industrial relations.

On December 18, 1984, NLO management was informed that environmental matters would be given greater emphasis in the award fee structure than had been the case in the past by specifying environmental management as a separate item for evaluating rather than including it with safety. This change will be in effect for the second half of FY 1985.

The above changes are intended to achieve a better balance in the consideration of all the evaluation factors. In addition, the Manager and the Deputy manager, OR will meet with the entire Award Fee Board and the Chairpersons of the Performance Evaluation Committees to personally assure that appropriate consideration has been given to each evaluation area.

24. The Task Force Report also says that the present sampling and analyses protocol at the FMPC is questionable. It said that sampling should be conducted for all emission sources which are operating, and, in particular the sampling of emissions sources such as particulates from incinerators was not being conducted. Aren't some of these particulates radioactive, and what is being done at this time to improve the sampling situation in order to ensure that compliance with applicable standards will be assured?

Answer: Some of the particulates are radioactive. An Oak Ridge Operations Office contractor, Oak Ridge Associated Universities, has conducted an evaluation of radiological onsite point of release monitoring at the Feed Materials Production Center (FMPC), as well as the onsite and offsite monitoring program currently in place at FMPC. The recommendations which included the need for additional monitoring stations and equipment upgrading are being implemented by NLO, Inc.

25. How long have the K-65 residues been stored in silos one and two at the FMPC and who has custody of the records showing what is contained in those silos? Has DOE ever expressed concern about leaks from the silos?

Answer: The K-65 residues were placed in silos one and two at the Feed Materials Production Center (FMPC) between 1952 and 1959. Detailed records on the silos are maintained by NLO, Inc. (NLO), at the FMPC and will be transferred to the new contractor when it assumes responsibility for the FMPC by April 1986. The Department of Energy (DOE) also retains major documents and reports, including records of environmental, safety, and health evaluations done at FMPC. The Department has been, and is concerned with, determining if the K-65 silos are leaking. In 1982, analyses were performed on soil samples taken from beneath the silos. Some samples had higher-than-background concentrations of uranium, but all the samples had essentially natural concentrations of radium. If the high-radium K-65 silos were leaking, then higher-than-natural concentrations of radium would be expected in the soil. The results of the 1982 analyses were not conclusive, but did not indicate any leakage of radium. Groundwater monitoring wells have been placed around the silos to further evaluate if the silos are a source of groundwater contamination.

26. On page six of the Incident Investigation Report on the September to December 1984 emissions, it says, "NLO does not have an effective program from which to closely monitor and control uranium emissions to as low as reasonably achievable (ALARA)." Less than two years before, on April 20, 1983, a performance evaluation committee examining the NLO Safety and Environmental Control Program, in accordance with the Award Fee plan for NLO stated, "performance in environmental, safety, and health areas during the period is the very aggressive posture that is being taken towards the ALARA program." How could NLO have been taking an aggressive posture regarding ALARA between October 1, 1982, and March 31, 1983, and then have been seen, less than two years later, as not having an effective program from which to closely monitor and control uranium emissions to as low as reasonably achievable? It apparently isn't a matter of things having gone to pot over a period of years because exactly one year later in a similar report, the Performance Evaluation Committee said, "Very little in the way of radiological controls or ALARA practices are in place to reduce or minimize exposure potentials." How could such widely disparate appraisals have been made by professionals at Oak Ridge?

Answer: The April 20, 1983, Semiannual Appraisal of NLO, Inc. (NLO), Safety and Environmental Control Program ranked activities in the establishment of a comprehensive health program as superior. However, the report indicated that no functional appraisal, or other onsite visits, were conducted during this evaluation period.

As was indicated in the response to Question 23, the new Oak Ridge Operations Office appraisal program will require that the appraisers spend more time in the plants and facilities to gain a first-hand view of operations.

27. It is difficult to understand exactly what the AEC was doing 25 years ago in terms of supervision of its contractors. In a report estimating stack losses for the month of January 1960 at the FMPC, there is the following statement: "Collectors G1-856 and G1-754 in Plant Two had a loss of 13 pounds of uranium for the month. However, this is believed to be only a portion of the loss since the vacuum on the stack samplers is inadequate. Plant Two maintenance was told of this condition and the defective pump was pointed out to the foreman early in November. In December, a work order was issued for Plant Tow's convenience by the Industrial Hygiene and Radiation Department and several telephone calls were made asking that an attempt be made to repair the vacuum pump or purchase a new pump if any further substantial delay was anticipated in its repair. As of February 1, Plant Two has exhibited no visible attempt provide adequate vacuums for these two stack samplers." There is obviously no thought being given here to reducing emissions on a timely basis. Didn't the AEC think that high levels of uranium emissions could be dangerous? Could this situation exist at a DOE plant today?

Answer: The quoted statement would appear to reflect frustration that Plant Two maintenance was not fixing a problem contributing to the inability to measure accurately uranium losses with the two stack samplers. The actual quantity of uranium mentioned is not a high level and would not have been characterized 25 years ago as dangerous. It is the policy of the Department of Energy to maintain releases as-low-as-reasonably-achievable, and we are committed to ensuring that our facilities comply with that policy.

28. (a) The Oak Ridge Operations Award Fee Guide says that the contractor's efforts must be evaluated on the basis of those factors which are under his control. For example, the contractor should not be penalized for failure to meet an environmental standard if funds needed to comply with the standard have been requested by the contractor but not made available by DOE. Did NLO request such funds? If not, why were they not penalized?

(b) On page seven of the Award Fee Guide it says that the Performance Evaluation Committees are to notify the contractor immediately of significant deficiencies which warrant corrective action. Were any deficiencies of NLO in the area of occupational health and safety or environmental protection noted in past reports? Were these deficiencies considered serious? Did those deficiencies affect the size of award fees given NLO in those years?

(c) Did the Award Fee Board make any adjustments in ratings that were given NLO by the Performance Evaluation Committees? Please explain.

(d) The Award Fee Guide says that personnel involved in the administration of the Award Fee provisions of the contract are encouraged to recommend changes and plant coverage with a view toward changing management emphasis, motivating higher performance levels, or improving the Award Fee determination process. Did anyone at DOE ever suggest emphasizing a more occupational health and safety or environmental protection at NLO?

(e) The Award Fee Guide says that deficiencies, if significant, could offset the recognition of contractor initiated performance improvement actions to the point that the "excellent" and "superior" ratings still would not be attained by the contractor. Did DOE consider NLO's performance on occupational health and safety and environmental protection deficient? If so, why did NLO receive "excellent" and "superior" ratings that allowed them to get a substantial award fee?

(f) The Award Fee Guide says that the determination of any award fee for any period is contingent on the contractor maintaining acceptable levels of ongoing performance in all areas under the contract, whether specified as award fee areas or not. Should the FDO determine that performance at one significant area of the contractor's operation does not meet the minimum acceptable level, then the FDO could determine that no Award Fee be paid for that period. Now, in Appendix Four, page two of the Award Fee Guide, there is listed under "Production" the objectives of producing required quantities of quality products within established production schedules, cost parameters, and acceptable safety and environmental protection standards. Was DOE's opinion of NLO's performance on safety and environmental protection standards satisfactory? If not, why didn't the FDO deny them the award fee?

Answer: (a) Following the initial $117 million construction of the Feed Materials Production Center (FMPC) in the early 1950's, an approximate $60 million expansion occurred in the mid-1950's. Metal deliveries peaked in 1960 and then in 1964 began to decline to a low in 1975. It was during the 1970's that consideration was given to closing the FMPC; therefore, capital improvements were minimized. From 1972 through 1979, the average annual capital funds authorized, in 1983 dollars, was $0.7 million.

With the direction from DOE in FY 1981 to plan for the FMPC restoration to accommodate projected product requirements that were to increase to near originally installed capacity, funding requests have been submitted by NLO. The first request, initiated in FY 1982 and reflected in a FY 1984 line item, includes the water treatment plant upgrade, the biodenitrification facility, treatment for coal pile run off, and a holding facility to handle storm water run off.

Nonetheless, while our contract does not provide for penalties in this regard, NLO was scored down in the award fee process for not being more aggressive in identifying weaknesses and proposing solutions.

(b) All Performance Evaluation Committee (PEC) reports are sent to NLO after each appraisal period. These reports identified deficiencies and most contained recommendations for corrective actions. The Safety and Environmental Control (S&EC) PEC did identify deficiencies, but did not offer recommendations since these deficiencies were not considered significant. The numerical grades assigned to the S&EC PEC have ranged around 90. A score of 90 would equate to a contractor earning only

75 percent of the available fee. The weights which the Award Fee Board assigned to the S&EC PEC were in the range of 20 percent or less, which means that even a low rating by the S&EC PEC would have had little impact in the final analysis since the production PEC with a larger percentage was controlling.

(c) Yes, the Award Fee Board made changes to the PEC's for NLO. These changes were made to maintain rating consistency with the language of the PEC and the criteria used in the PEC report. A table showing rating changes by the Award Fee Board is attached.

(d) At the close of each 6-month evaluation period, the Award Fee Board assigns weightings to each PEC Report based on a consensus of the board members as to relative importance of the subareas evaluated. The relative weights assigned to the subareas are subject to change each 6 months. As Mr. La Grone indicated in his testimony, the Award Fee Board for NLO assigned major weight to production operations. Obviously, Oak Ridge Operations has learned from this experience and intends to see that future award fee considerations reflect a better balancing of all the evaluation factors.

The Manager and Deputy Manager, Oak Ridge Operations, now meet with each Award Fee Board and the Chairmen of the PECs to assure that appropriate consideration is given to each evaluation area.

(e) The rating definition used for the award fee process defines excellent as "Performance meets standard. Although improvements may be required in some areas, this is more than offset by better performance in other areas." The span of performance points covered by "excellent" ranges from 80 to 95. Beginning with the first half FY 1985 award fee process, the definition of excellent has been changed to read "Performance exceeds standard. Although there may be several elements for improvement, these are more than offset by better performance in other elements." The span of performance covered by "excellent" has also been narrowed to 86 to 95. The S&EC PEC's have been within that range which would indicate that DOE did not consider NLO performance significantly deficient.

(f) In the past, the FDO has relied upon the Award Fee Board and the PEC's to identify to him deficiencies which should be reflected in the amount of the Award Fee. Thus, the interpretation of what is an acceptable level of performance was determined mainly by the Award Fee Board. As indicated under (d) above, this procedure has been changed for the Oak Ridge Operations Office.

Rating Changes by AF Board

Fiscal Year (FY)	Period	Safety & Env.		Eng. & Constr.		Budget	
		PEC	AF Board	PEC	AF Board	PEC	AF Board
1978	1						
	2						
1979	1						
	2	90	92			77	85
1980	1					80	85
	2					80	85
1981	1					84	87
	2					84	87
1982	1	87	89			87	89
	2	86	89			87	89
1983	1	89	90				
	2						
1984	1			80	81	82	85
	2			80	82		

29. A new land fill is being developed at the Fernald Site to contain non-hazardous, non-radioactive solid waste. The land fill will be permitted under State requirements. The State has reviewed the location of the new land-fill and given its approval. Is it now DOE policy to follow State permitting requirements with respect to land-fills or other waste disposal sites, or storage areas containing non-hazardous, non-radioactive wastes?

Answer: The Department's policy is to obtain State permits for these landfills.

30. Does the last paragraph of page three of Mr. La Grone's letter to Mr. Montanari of November 29, 1984, mean that the Award Fee for the first part of FY '84 was retroactively increased? What was it increased to and when was this Award Fee actually paid to NLO?

Answer: The fee available to an Award Fee Contractor is based on total dollars estimated under contract. At the time that the Department of Energy (DOE) determined the estimated funding that would be available for NLO, Inc. (NLO), contract, Oak Ridge had not received funding for a major uranium processing activity planned for the Feed Materials Production Center (FMPC). Since the fee is determined from the estimated funding available under the operating contract, it was not possible to include the new activity, even though this new activity was identified at the time of fee negotiations. This funding did arrive later in FY 1984 and was placed in the NLO contract. This required DOE to adjust retroactively, the available fee to reflect this major funding increase. The fee was not increased due to performance, but due to a material increase in the scope of work as authorized under the provisions of the contract.

The award fee for the first half of FY 1984 was increased from $626,129 to $697,414, or an increase of $71,285. The contract modification to authorize this adjustment to the award fee was dated March 19, 1985.

31. Page five of Mr. Cochran's testimony states that the annual effective whole body dose from fallout is less than two millirems on the average. Does DOE have information comparing the fallout doses in the 1950's before the Test Ban Treaty to the exposures resulting from releases from the FMPC? If so, please provide year-by-year comparison.

Answer: The Department of Energy does not have information comparing fallout doses in the 1950's to exposures resulting from releases from the Feed Materials Production Center.

32. The Task Force Report states that, because of management problems at NLO the overall environmental compliance cannot be assured in the near term. The Report also suggests that NLO, rather than taking its own initiatives for satisfying environmental requirements, has requested DOE-ORO to specify the solutions. Why didn't ORO demand that NLO hire environmental experts to deal with this problem?

Answer: As the Task Force Report indicates, NLO, Inc. (NLO), is attempting to augment their staff with well qualified personnel. Hiring experts, however, is not the entire solution. The Task Force Report points out problems and is intended to provide both NLO and Department of Energy management with a baseline evaluation of the operations at the Feed Materials Production Center and to serve as a basis for making improvements.

33. What progress was made in environmental management and health protection by NLO between May 23, 1984, and November 29, 1984, to allow an award fee to be given to NLO for the second half of FY '84 after concerns were expressed in the May 23 letter about environmental management and health protection?

Answer: During the period from April 1 to September 30, 1984, (the period covered by the second half FY 1984 Award Fee) the following accomplishments by NLO, Inc. (NLO), were considered significant by the Safety and Environmental Control Performance Evaluation Committee.

A newly installed ultraviolet processing system for wastewater was placed in service in August 1984. This system replaced the chlorine process which had formerly been in use and was causing problems with meeting National Pollutant Discharge Elimination System permit requirements for considerations of chlorine in effluents. NLO also made other improvements in wastewater treatment by diverting sump water from Plant 5 (containing oil) to Plant 6 for processing. Ammonium hydroxide, which had been used in the plant water treatment system, was replaced with sodium hydroxide to minimize ammonia in the treated effluent.

In an effort to reduce beta radiation exposure to workers, NLO undertook a study of additives (CaF_2 and MgF_2) which collect compounds associated with high-activity uranium daughters and appear to be very promising for reducing radiation in the uranium ingot production operations. An ingot pickling facility is also under construction to further reduce personnel exposures in ingot production. Both these activities represent significant initiatives developed by NLO to address the major source of radiation exposure to employees.

The above activities were in addition to:

Completion and submission to Oak Ridge Operations Office of a draft Environmental Assessment for the Low-Level Waste Processing and Shipment System.

The Feed Materials Production Center (FMPC) Environmental Monitoring Annual Report for 1983 was completed and published by NLO in August 1984. This report was a compilation of all environmental monitoring data collected at the FMPC during 1983.

A computerized air sample recordkeeping system was completed in April 1984, which made it possible for direct data input to an online computer and to quickly recall and compile air sample data.

Increased construction at the FMPC required an increased level of inspection of subcontractor work sites by NLO. For example, in June 1984, a total of 292 inspections were made at work sites.

Thirty-three percent of these inspections found unacceptable practices or unsafe equipment.

34. The Annual Environmental Monitoring Report contains off-site dose estimates which depend upon meteorological conditions among other things. At this time a new meteorological tower system is being put in place in order to more accurately obtain local wind data. Since there was no such system in the past, how reliable were the meteorological data on which past dose estimates were made?

Answer: NLO, Inc. (NLO), used meterological data from the Cincinnati Airport in calculating dose estimates contained in the Environmental Monitoring Report. The U.S. Environmental Protection Agency also used Cincinnati Airport meterological data for regulatory assessments in preparations for promulgating National Emissions Standards for Hazardous Air Pollutants.

When the Feed Materials Production Center meterological tower begins operation, data which is more relevant to the site will become available and will be used.

35. Was NLO required to conform to CERCLA reporting standards? In a statement made by Mr. Weldon Adams, Assistant Plant Manager, in connection with the DOE investigation of the releases of September to December 1984, he states: "I had personally received no instructions or other indication that CERCLA reporting standards were required. Certainly there was no written instruction indicating that the more stringent reporting standards were necessary." Does DOE have any evidence that NLO management understood the reporting requirements?

Answer: The Department of Energy (DOE) requires its contractors to meet Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requirements, and where notification is required, the contractors are required to notify DOE, which in turn notifies the appropriate authority. As discussed in the Investigation Report (page 37), controversy surrounds the issue of CERCLA requirements as they pertain to the Feed Materials Production Center (FMPC). NLO contends that formal DOE guidance had not required full compliance with all CERCLA requirements. This official guidance was contained in a 1981 letter to NLO from DOE which only required the Oak Ridge Operations Office (OR) contractors to report accidental or episodic hazardous substance releases for which remedial action might be necessary. DOE staff recall having orally advised the NLO Director of Health and Safety to meet CERCLA requirements, but no written guidance revising the 1981 letter had been issued.

This situation was corrected by DOE. The letter formally instructing NLO to comply with the requirements of CERCLA is dated January 23, 1985, and is attached.

Subsequently, NLO has been reporting, as required, to DOE.

1-23-85

Mr. R. A. Spenceley
Plant Manager
NLO, Inc.
P. O. Box 39158
Cincinnati, Ohio 45239

Mr. H. R. Schaeffer
Plant Manager
RMI Company
P. O. Box 579
Ashtabula, Ohio 44004

Gentlemen:

ENVIRONMENTAL REGULATORY COMPLIANCE POLICY

As discussed with you and members of your staff on numerous occasions, this is to reiterate that the DOE believes that you are expected to operate your facilities in full compliance with all environmental regulations, and as directed by Executive Order 12088, operate your facilities in an exemplary manner embracing the letter and spirit of environmental regulations and environmentalism. Neither the DOE nor its contractors claim any exemption or exclusions from the provisions of any state or Federal environmental regulations pursuant to the Clean Air Act, Clean Water Act, Toxic Substances Control Act, National Environmental Policy Act, Endangered Species Act, Fish and Wildlife Coordination Act, Historic Preservation Act, Safe Drinking Water Act, Corps of Engineers permitting requirements, 10CFR1022 DOE Implementation of Floodplain/Wetlands Environmental Review Requirements, or the Comprehensive Environmental Response, Compensation and Liability Act (including one pound and greater unanticipated release reporting requirements).

With regard to the Resource Conservation and Recovery Act (RCRA), DOE will comply with Federal and State regulations for hazardous waste. For radioactive mixed waste, the determination of which waste will be regulated by RCRA is currently being made. In any case, until this decision is made, all radioactive mixed waste streams should be substantively treated as RCRA, regulated, and the treatment, storage, and disposal facilities operated in full compliance with existing Federal and State technical requirements. RCRA procedural requirements will be met for the time being by providing, for mixed waste streams, informal informational data regarding these mixed waste streams. Permitting of such streams will, however, await final determination (following rule making) of which mixed waste streams wil be classified as "hazardous" (vie AEA regulated) streams. You and your staff should become totally and intimately familiar with and live by all the above acts and provisions.

Enclosed is a short guide to Environmental Incident Reporting which will provide some guidance on how to cope with Comprehenive Environmental Response, Compensation and Liability Act reporting requirments. As indicated on the first page of the guide, our public information policy is to report to the media just about any incident out of the ordinary, whether it is a safety and environmental incident, a new major contract letting, etc. Of course, the requirements of 5484.1 and 5484.2 are to be strictly followed. When in doubt, call Gabe Marciante or Malcolm Theisen for guidance.

If you have any questions about this letter, please call Gabe Marciante at FTS 626-4119.

Sincerely,

M. R. Theisen
Director
Weapons Division

DP-81:Marciante

Enclosure:
As stated above

36. An environmental management and protection factor will be included in the award fee plan in the new contract that is selected to operate the Fernald plant. Can you tell us what standard will be applied in judging performance? For example, will DOE require that emissions be below a fixed quantity?

Answer: The environmental management factor for the award fee has not been developed since the new contractor has not been selected, and we are not yet able to tailor the plan consistent with his proposal. We assure you, however, that the environmental management factor will receive detailed and highly visible treatment.

37. The June 1984 Task Force Report also said: "The Task Force believes that the NLO Award B contract is not being used as effectively as it could be in focusing the contractors efforts toward new objectives and required improvements. The ratings given under the Award Fee contract have conveyed to NLO the impression that performance has been almost superior and that the operations is being conducted almost exactly as DOE desires (i.e., there is even very little room left for improvement). This is not the case and the full incentive potential of Award Fee Contracting is not being realized with respect to the NLO contract." Was DOE aware that this criticism was going to appear in the Task Force Report when it wrote to the Executive Vice President for Operations of NL Industries, Mr. Fred Montanari, on May 23, 1984, informing him of NLO's award fee?

DOE also wrote to Mr. Montanari on November 29, 1984, informing him of another Award Fee for the second half of FY '84 commending him for the overall excellent performance of NLO Incorporated during the last half of FY 1984. Why were the recommendations of the Task Force so blatantly ignored? Please explain the amount of the Award Fees for the first and second half of FY '84 and what percentage the award fees were of the eligible amount had the performance of NLO been absolutely perfect in all areas?

Answer: The Task Force Report was dated June 1984. Therefore, the Department of Energy was not aware of these criticisms when its May 23, 1984, letter was sent to Mr. Montanari. The Task Force report was not delivered formally to the cognizant program organization until September 1984; however, the Manager, following the July briefing by the Task Force, directed the cognizant program organization to proceed in the meantime with the contractor with the preparation of a corrective action plan.

The recommendations of the Task Force Report have not been ignored. On September 27, 1984, the Task Force Report was sent to NLO, Inc. (NLO), requesting an action plan with milestones and funding needs to address the recommendations. NLO responded on October 31, 1984, with an action plan.

For the first half of FY 1984, covering the period October 1, 1983, through March 31, 1984, the Award Fee for NLO was $697,414 out of a total Award Fee available for this period of $896,650.

For the second half of FY 1984 covering the period April 1, 1984, through September 30, 1984, the Award Fee for NLO was $680,826 out of a total award fee available for this period of $896,650. Thus, the percentage of fee received versus what was available was 66.7 percent.

38. Page four of Mr. Cochran's testimony states that DOE Order 5485.1 requires employees be informed within 24 hours of any radiation over-exposure and furnished a summary of their exposures within three days of submitting a written request. What were the dates that these orders went into effect? If they were in effect in 1956, did any employee get notified about over-exposure? In those days, it was required that a worker enter the bag-house and shake the bags three times during each shift in order to keep the filters operating appropriately. Would it have been possible for someone performing the job to have done so without experiencing over-exposure?

Answer: Department of Energy (DOE) Order 5484.1 (issued February 24, 1981) requires employees be notified within 24 hours of any radiation exposures that exceed the dose equivalent standards specified in DOE Order 5480.1A, Chapter XI (issued August 13, 1981), and that a summary be provided within 30 days after receipt of a written request.

Since 1956, only one radiation exposure in excess of DOE quarterly limits has been reported at the Feed Materials Production Center. This occurred in the first quarter of CY 1980 when one employee received a radiation dose to the skin of the whole body in excess of the quarterly limit for skin exposure.

Radiation exposure records for millwrights involved in bag-house operations in the 1950's indicate that no over-exposures occurred.

39. Page six of Mr. Cochran's testimony discusses the Privacy Act procedures to provide NIOSH access to records at the FMPC. According to DOE many adverse comments were received on the DOE proposal to include access to records at all DOE facilities, and that these comments were from physicians opposing such a blanket release of medical records. Isn't it true that most, if not all, the physicians were working, at least part-time, for the contractors, and that it would have been the records that they had prepared which NIOSH would have been examining?

Answer: As noted in this question, the National Institute for Occupational Safety and Health (NIOSH) did receive access to medical records at the Feed Materials Production Center (FMPC), as requested. In order to facilitate potential future requests by NIOSH for access to medical records of other Department of Energy (DOE)/contractor employees, the Department initiated action under the Privacy Act to provide for the routine use by NIOSH of all such medical records. It is true that (1) most of the physicians who opposed this routine use by NIOSH were, in fact, working for DOE contractors; and (2) it would have been the records that they (the physicians) had prepared which NIOSH would have been examining. However, the physicians' objections were based upon their beliefs that such a routine use would definitely compromise their doctor-patient relationships and undermine the confidential nature of the medical records in question.

40. In a report dated October 3, 1983, from Mr. M. R. Theissen to Mr. R. M. Spenceley, concerning the nuclear criticality and transportation safety appraisal of NLO, Incorporated, an incident is described in which a drum of depleted uranium hexafluoride failed in transit from the Paducah Gaseous Diffusion Plant during February, 1982, and the contents were released. What was the size of this drum? Was this one of the five-ton "hoppers" mentioned earlier in the report and what is the radiation hazard associated with such releases?

Answer: The material was uranium tetrafluoride (green salt) in a 55 gallon Department of Transportation (DOT) Spec 17H drum. It was discovered that the drum had a defect along the bottom edge where a small crack allowed material to be released. Approximately 1 pound of the 450 pounds of the uranium tetrafluoride was lost. The material was noted by DOT as having nearly insignificant hazard potential.

41. On April 17, 1984, a Performance Evaluation Committee Appraisal Report for the first half of 1984 was issued concerning the Maintenance Management Program. The contractor's Maintenance Management performance for this period was rated by this committee as being "excellent". In the same report, however, it is stated that "the routine work backlog has been increasing over the past year to its present level of approximately 92,000 manhours or roughly 14 manweeks. A normal operating level is about eight manweeks. This is a definite concern." How could the PEC detail such a departure from normal operating levels by NLO and still rate the performance as being "excellent"?

Answer: The Performance Evaluation Committee Report - Maintenance Management Program - First Half FY 1984 states that the rating of excellent indicates that performance meets standards. Furthermore, it was the appraiser's judgment, as stated in the report, that although improvements are required in some areas, they are more than offset by better performance in other areas.

In discussing the routine work backlog, the appraiser pointed out several likely causes for the backlog: significant production increases; equipment age; fixed stores levels; and long procurement times. The appraiser also indicated that NLO, Inc., was working in several ways to reduce the backlog such as hiring more craft persons and increasing the stores level.

42. The Task Force Report recommended that the DOE performance criteria and Performance Evaluation Committees be revised to better focus NLO's attention on the pursuit of innovative management initiatives designed to improve a number of areas, including the safety and health of employees and environmental protection. Despite this, on August 29, 1984, three special Performance Evaluation Committees were created for NLO and none of them dealt with occupational health and safety or environmental protection. Why was this recommendation ignored?

Answer: In retrospect, Environmental Management and Protection should have been set out as a separate item as were the other areas identified in the August 29, 1984, letter. This was done in December 1984.

By letter dated December 18, 1984, DOE informed NLO, Inc., that the Performance Evaluation Committees (PEC) would be changed and Environmental Management and Protection would be established as a separate PEC. The six PEC's for the second half of FY 1984 are:

1. Production Operations
2. Health, Safety, and Fire Protection
3. Environmental Management and Protection
4. Engineering and Construction
5. Maintenance Management
6. Budget

In addition to these six PECs, three special areas identified in the August 29, 1984, letter will also be considered. These special areas include safeguards and security, small disadvantaged business procurement, and industrial relations.

43. Does DOE believe that NLO Has been following policy of keeping radiation exposures as low as reasonably achievable (ALARA)? At what point was DOE aware that ALARA was not being followed by NLO? Did DOE ever inform NLO that it was not meeting the stated objectives of conducting "an effective and efficient health physics program in accordance with DOE requirements" because it was not meeting the ALARA criterion?

Answer: The Department of Energy (DOE) policy on radiation exposure is that exposures can and should be maintained lower than the standards through considerations in the design or modification of facilities and equipment, reduction in errors in radiation exposure assessments by the application of state-of-the-art instrumentation maintenance and calibration, and by the institution of appropriate procedures and training. As early as 1977, shortly after the adoption of the as-low-as-reasonably-achievable (ALARA) concept by the Energy Research and Development Administration, one of the DOE predecessor agencies, a health physics appraisal of NLO pointed out the need to take procedural and engineering steps to reduce skin and extremity exposures. Subsequent appraisals in 1978 and 1980 also emphasized the need for a more aggressive ALARA program. Detailed studies of exposure sources were also recommended and accomplished by NLO, Inc., in 1983. This study resulted in improved accuracy in the measurement of beta radiation exposures. Each health physics appraisal is formally transmitted to the contractor for implementation of the recommendations.

44. Please describe the major beta exposure problem in ingot process work at NLO and the dose rate associated with it. How is DOE helping NLO to deal with this problem? Why are exposure trends to the FMPC increasing?

Answer: Beta radiation exposure occurs from the uranium daughters present on the surface of the cast ingots. Therefore, the highest exposures occur to those individuals who must directly handle the ingots during such operations as sawing, cleaning, and inspecting. Dose rates can vary from tens of millirads/hr up to 1,500-2,000 millirads/hr depending on the pretreatment the ingot may have received. To reduce the beta radiation exposure potential, the Department of Energy (DOE) has supported NLO, Inc. (NLO), efforts in developing techniques, such as nitric acid pickling, to reduce the surface contamination prior to necessary handling. Process improvements, such as automated handling tools, have also been identified by NLO and supported by DOE through additional operating and capital equipment funding. Some of these are currently being installed.

Beta radiation exposure trends appear to be leveling off at this time. In the time period from 1980 through 1984, the trend was increasing. This increase was partially attributed to the implementation of a new external dosimetry program utilizing thermoluminescent dosimeters. It was determined, in Spring 1984, that an incorrect algorithm had been used in the final determination of beta exposure and that when the correct algorithm was applied, the exposures were reduced. It is important to note, however, that no exposures exceed the annual DOE radiation protection standards, and that significant exposure reduction has occurred when compared to exposures received in the mid-to-late 1970's.

45. On November 29, 1984, five hourly workers who were repairing the high vacuum system in plant nine were exposed to a puff of about four pounds of U308. The workers were not wearing respirators during the repair activities. Urinalysis tests were not performed following the exposures, and no report was made to NLO management concerning the exposure at that time. The workers were subsequently analyzed about two weeks later in a radioactivity whole body counter. They were informed that their lung burden had not increased over previous levels. How sensitive was this test and does waiting two weeks make the results somewhat suspect?

Answer: For the materials utilized at NLO, Inc. (NLO), and monitored for in the whole body counter, the counting sensitivity is such that a 20 percent organ burden is assured of being detected, while lesser quantities have larger error ranges associated with the results. Repeated counts, which show consistency, either following a single exposure, or conducted routinely over time, increase the confidence that the results are correct.

Uranium compounds used at NLO have varying degrees of solubility in body fluids. Those that are very soluble are most readily detected by urinalysis, while those that are insoluble are most readily detected by whole body counting. The insoluble material will remain in the lung for relatively long periods of time (years), whereas the soluble materials are eliminated quickly.

The U_3O_8 involved in the referenced incident has a solubility classification of Y, meaning that the biological half-life (elimination time) is in years. It would, therefore, be expected that had a significant exposure occurred on November 29, 1984, whole body counting 2 weeks later would have detected any increase over previous levels. There was not any such increase.

46. A new Department of Energy Headquarters Task Force has reviewed the health physics program of NLO, Inc., on the worker protection aspect of the program. The Task Force's report is supposed to comment on the adequacy of monitoring instrumentation, and on NLO, implementation of its monitoring and control procedures. What is the status of this report and what is its content at this point?

Answer: On February 28, 1985, the Office of Security and Quality Assessments, Defense Programs, assembled a Task Force to review health physics practices at the Feed Materials Production Center (FMPC). The Task Force conducted an onsite review of FMPC on March 6-8, 1985, and provided the Oak Ridge Operations Office (OR) with a copy of its findings and recommendations on May 3, 1985. A copy of the Task Force Report has been provided to the Committee. OR and NLO, Inc., are addressing in an aggressive manner the recommendations contained in the Report.

47. In some of the sample quality assurance analysis reports on which unusual releases are reported, there is a space for putting down the rationale for considering a release as being serious. The rationale of "local notoriety" has been used in some of these reports. That suggests that those who filled out the reports did not really consider the release and subsequent contamination and exposure to radioactivity as being terribly important, but felt rather that the notoriety stemming from the release was the problem. Does DOE consider these releases as primarily a PR problem or could they have an adverse effect on the health of the workers at the plant and people living in the surrounding communities?

Answer: The Department of Energy (DOE) takes seriously all releases and seeks to control them. Quality assurance analysis reports are internal NLO, Inc., documents used by the contractor to determine the potential for health and safety risks and the need for quality assurance plans. Other mechanisms exist for incident reporting which are more timely and intended to provide DOE with information that may be needed for reporting to local, State, and Federal regulatory agencies and the press.

48. On page five of Mr. Cochran's testimony, it is stated that in 1984, the most recent year for which data are available on public doses, the highest calculated whole body annual dose to the maximally exposed individual near any DOE maximally exposed individual near any DOE facility was 34 millirems at Los Alamos. This exceeds EPA's limit of 25. What happened in that case?

Answer: In 1984, the year in which a 34 millirem estimated offsite whole body dose was reported at the Los Alamos National Laboratory, the EPA standard was 500 millirem/year for an individual member of the public (Federal Radiation Council Report No. 1, May 13, 1960). In February 1985, EPA promulgated a 25 millirem/year limit for DOE facilities. DOE shut down the Los Alamos Meson Physics Facility (the primary source of the offsite dose) in October 1984 for modifications intended to reduce offsite dose. It is anticipated that these modifications will bring the facility into compliance with the current EPA standard of 25 millirem/year.

49. Page eight of Mr. La Grone's testimony discusses a NIOSH recommendation that four NLO employees be sent to Argonne National Laboratory for comparison whole body counting. The results obtained at Argonne were inconsistent with the uranium isotopes in use at the FMPC. Please explain the inconsistency.

Answer: The results reported by the Argonne National Laboratory indicate that, for two of the individuals monitored, the uranium found was isotopically enriched in Uranium-235 between 14 percent and 30 percent. No material with an enrichment greater than 20 percent has ever been processed at the Feed Materials Production Center. The National Institute for Occupational Safety and Health is continuing to evaluate other whole body counters that may be able to resolve the discrepancies. A copy of the Argonne National Laboratory results is attached.

HP Branch

ARGONNE NATIONAL LABORATORY
9700 South Cass Avenue, Argonne, Illinois 60439
Telephone 312/972- 4132

February 27, 1985

Dr. James Smith
NIOSH
Robert A. Taft Laboratories
4676 Columbia Parkway
Cincinnati, Ohio 45226

Dear Jim:

At long last I am reporting the results of the body radioactivity measurements of the four NLO employees performed on 21 January 1985. The results are mildly surprising, based on the statements of the individuals regarding possible exposure. One subject, NIOSH-22, contained easily measurable activity; another, NIOSH-26, contained activity slightly above the limit of detection; and the other two, NIOSH-50 and NIOSH-51, were below the limit of detection. However, the activity seen in the first two appeared to be enriched uranium, rather than natural or depleted uranium.

The measurements upon which these results are based were made with our "phoswich" detector, which consists of a thin NaI crystal backed by a thicker CsI crystal, with the latter used as an anticoincidence shield. This detector looks at two energy bands, 12-24 keV and 40-120 keV. Counts from ^{235}U will be recorded in both energy bands, while counts from ^{238}U (and daughters) will occur almost exclusively in the latter. Therefore, by comparing the net counting rates in the two bands for each individual, we can get a handle on the relative amounts of ^{235}U and ^{238}U. In the two cases for whom we had positive results, all the counts in the 40-120 keV band could be accounted for by the ^{235}U activity determined from the 12-24 keV band. Consequently, I am reporting results as mg of ^{235}U, with no ^{238}U observable. This is puzzling, since the two subjects reported exposure to depleted uranium. I would be very interested in the results of any excreta analyses performed for these subjects.

A few other points to be noted: subject backgrounds were subtracted from the gross counting rates based on a prediction equation relating subject background to body size. The equation was derived from measurements of over forty control subjects. Calibration factors and therefore limits of detection are also dependent on body size; calibrations were obtained from a realistic chest phantom (developed at Livermore) with lungs loaded with either enriched or natural uranium. The limit of detection is taken as twice the statistical standard deviation of the measurement. Finally, whole-body counts with large NaI crystals in both reclining chair and flat bed geometries showed no evidence for γ-emitters except ^{40}K and some ^{137}Cs from global fallout.

The results (± one standard deviation):

Subject number	^{235}U content, mg	Detection limits, mg	
		^{235}U or	^{238}U
NIOSH-22	0.48 ± 0.07	0.14	1.6
NIOSH-26	0.17 ± 0.06	0.12	1.2
NIOSH-50	0.17 ± 0.14	0.28	1.8
NIOSH-51	0.19 ± 0.12	0.24	1.6

I am sending a copy of this letter to the HP at NLO, William Hayes. I am sending individual letters with their results to each of the four subjects. Finally, if anyone wants further measurements done, I recommend that Jerry Rosen at the University of Pittsburgh be contacted (412-647-3595). As far as I know, his lab is not supported directly by DOE, although I believe he does some uranium in lung measurements for DOE contractors.

Feel free to call me if you need more information.

Sincerely,

Dick

Richard E. Toohey, Ph. D.
Biophysicist

RET:llf

cc: W. Hayes, NLO ✓

50. Page 16 of Mr. La Grone's testimony states that a large release of uranium hexafluoride gas occurred at FMPC in February 1966 and that discharge through water was the principal environmental pathway. Please explain this statement further. Does DOE have an estimate of the level and effect of this discharge? What exposures were persons living downwind from the release subjected to?

Answer: Copies of the 1966 report of the investigation into the uranium hexafluoride gas release at the Feed Materials Production Center (FMPC) and applicable correspondence were provided to the committee staff in April 1985. Mr. La Grone's testimony pointed out that in the material provided the Congress, the press release issued on the day of the accident indicated that the uranium hexafluoride was confined to the site. Subsequently, the investigation report indicated that some uranium did leave the site via Paddy's Run. The level of the discharge into Paddy's Run is shown on page 79-26 of the report. The highest uranium concentration was 5×10^{-6} μCi/cc which was below the applicable Atomic Energy Commission standard. The investigation report did not include estimates of exposures to persons living downwind.

PREPARED STATEMENT OF ROBERT M. SPENCELEY

Senator Glenn's Specified Area of Inquiry

1. Your understanding of DOE's requirements in the area of health and safety for workers and residents in nearby areas, including documented evidence that DOE found your performance in keeping with their requirements.

NLO Response:

NLO believes it has a good understanding of DOE's environmental, safety and health (ES&H) requirements. Two-thirds of the DOE performance ratings received by NLO have been above "satisfactory."

DOE's principal requirements for environmental, safety and health (ES&H) protection programs are contained in a series of DOE Orders which are part of the DOE Directive System. These Orders establish policies, procedures and standards for various DOE management levels and for the DOE prime contractors. Many Orders are supplemented with companion documents issued by the DOE Oak Ridge Office. Announcements, directives and letters are also issued by DOE-HQ and DOE-ORO to provide additional guidance, instruction or interpretation for the Order series.

NLO, Inc. receives from DOE-ORO eleven copies of new or revised Orders and other Order-related documents. One copy is sent directly to the NLO Manager and ten copies are sent to the Director of the Technical Division who distributes the copies to the NLO Divisions. Additional copies are obtained with a phone call to the distributing office at Oak Ridge.

The major Order dealing with ES&H matters is DOE Order 5480.1A, "Environmental Protection, Safety, and Health Protection Program for DOE Operations." A companion document from the Oak Ridge Operations Office is OR 5480.1A, same title. In slightly more than 250 pages, these documents give the basic elements of required ES&H programs and list specific limits for radioactivity discharges and for radiation exposure of workers, nearby residents, and the general public.

Order 5480.1A contains eleven chapters (plus two reserved chapters) which contain required major program elements and list other prescribed and recommended standards which are to be followed or consulted. These referenced standards consist of other DOE documents; requirements or guides published by the U. S. Nuclear Regulatory Commission (NRC), U. S. Environmental Protection Agency (EPA), U. S. Department of Transportation (DOT) and other federal regulatory agencies; codes and guides published by professional groups such as the American National Standards Institute (ANSI), National Fire Protection Association (NFPA), and the National Council on Radiation Protection and Measurement (NCRP).

Table 1 is a reprint of the Environmental Protection section of Chapter I, DOE 5480.1A. Twenty-five prescribed standards and eight recommended standards are listed for the topic of environmental protection. Table 2 is a reprint of the Chapter I attachment which lists sources for the standards that are prescribed or recommended in Chapter I.

In addition to requirements and objectives spelled out in the Orders, there are additional objectives set by ORO policy that evolves in correspondence or meetings. For example, Chapter XI of 5480.1A lists the maximum allowable concentration for radionuclides in water in uncontrolled areas, such as the Great Miami River which receives the treated liquid effluent from the DOE Feed Materials Production Center (FMPC) operated by NLO, Inc. Historically, these limits apply to the river, after thorough mixing of the site effluent. A policy evolved at ORO that set the desired goal of meeting the limits before mixing; that is, the offsite limits would be met when the effluent left the site boundary even though there was no known use of the river water for human consumption. That policy has been followed by NLO and the more restrictive interpretation applied to the site discharge.

NLO performance in ES&H areas is reviewed by DOE-ORO through formal onsite appraisals. Typically, a DOE-ORO representative will call his NLO counterpart in one of the ES&H areas and discuss appraisal dates. This conversation is followed by a letter from DOE-ORO formally announcing the dates for the appraisal visits. Usually, the appraisers are identified. Most appraisals require several days to complete and may include file reviews, discussions with NLO ES&H staff and other NLO personnel, site tours and a closeout interview with the NLO Manager and other staff members. An appraisal report is sent several weeks later to NLO from DOE-ORO with a request for a response regarding recommendations contained in the report. In the past, most appraisal reports carried a rating for the program. Until the late 1970's, programs were rated as either "satisfactory" or "unsatisfactory." With a change in measuring contract performance, a new rating sequence was introduced: Poor, Marginal, Satisfactory, Excellent, and Superior. Over the past 10 years, DOE-ORO has found NLO's performance to be "satisfactory" or better with one exception; in 1980, the appraisers perceived deficiencies in the health physics program and assigned a rating of "poor." Since that time, the program has been rated "satisfactory." Table 3 lists the appraisal ratings given the ES&H programs since 1975.

In addition to these appraisals, the overall ES&H effort is rated semiannually by the ORO Office of Performance Evaluation in connection with the award fee contract. With seven ES&H categories rated semiannually, there have been 84 rating opportunities over the last six fiscal years. Seventy-seven ratings were actually assigned: Superior, 10; Excellent, 50; Satisfactory, 14; Poor, 3; no rating given, 7. In the three cases where a rating of "poor" was assigned, NLO took actions to improve the programs and received subsequent ratings of "satisfactory" and "excellent" in those same programs. While we recognize there is room for innovative improvements in all site programs, we have concluded from these ratings, and from the discussions that are part of the rating process, that there has been an overall DOE satisfaction with NLO's performance in ES&H areas. The semiannual performance evaluation ratings for the environmental, safety and health programs for the last six fiscal years are listed in Table 4.

Table 1. DOE Prescribed and Recommended Standards for Environmental Protection

6. ENVIRONMENTAL PROTECTION. The following standards, in addition to those listed in the other chapters, shall be used as applicable.

   a. Prescribed Standards.

      (1) Executive Order 12088 "Federal Compliance with Pollution Control Standards."

      (2) The following standards, regulations, and guidelines promulgated pursuant to Federal environmental legislation:

         (a) Air.

            1 New Source Performance Standards (40 CFR 60).

            2 National Hazardous Air Pollutant Standards (40 CFR 61).

            3 Regulations Designating Air Quality Control Regions (40 CFR 81).

         (b) Water.

            1 Discharge of Oil (40 CFR 110).

            2 Oil Pollution Prevention (40 CFR 112).

            3 National Oil and Hazardous Substances Contingency Plan (40 CFR 1510).

            4 Water Quality Standards Approved by the Federal Government (40 CFR 120).

            5 National Pollutant Discharge Elimination System (40 CFR 122).

            6 Policies and Procedures for the National Pollutant Discharge Elimination System (40 CFR 125).

            7 General Pretreatment Regulations for Existing and New Sources of Pollution (40 CFR 403).

            8 Secondary Treatment Information (40 CFR 133).

            9 Transportation for Dumping, and Dumping of Material into Ocean Waters (40 CFR 220-230).

            10 Cooling Water Intake Structures (40 CFR 401.14) (General Provisions for Effluent Guidelines and Standards - 40 CFR 401).

(c) Drinking Water.

1 National Interim Primary Drinking Water Regulations (40 CFR 141).

2 National Interim Primary Drinking Water Regulations Implementation (40 CFR 142).

(d) Solid Waste.

1 Guidelines for the Thermal Processing of Solid Wastes and for the Land Disposal of Solid Wastes (40 CFR 240 and 241).

2 Solid Waste Storage and Collection (40 CFR 243).

(e) Radiation. "Performance Testing and Procedural Specifications for Thermoluminescense Dosimetry (Environmental Applications)," ANSI N 545-1975 (ANSI).

(f) Pesticides.

1 Executive Order 11870, "Environmental Safeguards on Activities for Animal Damage Control on Federal Lands."

2 Regulations for Enforcement of the Federal Insecticide, Fungicide, and Rodenticide Act (40 CFR 162).

3 Regulations for the Acceptance of Certain Pesticides and Recommended Procedures for the Disposal and Storage of Pesticides and Pesticide Containers (40 CFR 165).

4 Exemption of Federal and State Agencies for Use of Pesticides Under Emergency Conditions (40 CFR 166).

5 Worker Protection Standards for Agricultural Pesticides (40 CFR 170)

6 Certification of Pesticide Applicators (40 CFR 171).

b. Recommended Standards.

(1) Standard Methods for the Examination of Water and Wastewater (AWWA).

(2) Guide for Use of Insecticides, Handbook 290 (USDA).

(3) Manual of Septic Tank Practice, Publication No. 526 (USPHS).

(4) Sanitary Landfill Design and Operation Publication No. SW-65ts. (EPA).

(5) Interim Guide of Good Practice for Incineration at Federal Facilities, Publication No. AP-46 (USPHS).

(6) Incinerator Guidelines, Publication No. 2012 (USPHS).

(7) Air Pollution Engineering Manual, Publication No. AP-40 (USPHS).

(8) Compilation of Air Pollutant Emission Factors (EPA).

Table 2. Sources of Prescribed and Recommended Standards

SOURCES OF STANDARDS

1. AAOO American Academy of Ophthalmology and Otolaryngology
15 Second Street, SW.
Rochester, Minnesota 55901

2. AASHTO American Association of State Highway and Transportation Officials
444 North Capitol Street, NW.
Washington. D.C. 20001

3. ACGIH American Conference of Governmental Industrial Hygienists
2205 South Road
Cincinnati, Ohio 45238

4. AGCA Associated General Contractors of America, Inc.
1957 E Street, N.W.
Washington, D.C. 20006

5. AIHA American Industrial Hygiene Association
475 Wolf Ledges Parkway
Akron, Ohio 44311

6. AMC United States Department of the Army
Headquarters, U.S. Army Material Development and Readiness Command
Pentagon
Washington, D.C. 20310

7. ANSI American National Standards Institute
1430 Broadway
New York, New York 10018

8. API American Petroleum Institute
2101 L Street N.W.
Washington, D.C. 20037

9. ASME American Society of Mechanical Engineers, Inc.
345 East 47th Street
New York, New York 10017

10. ASTM American Society for Testing and Materials
1916 Race Street
Philadelphia, Pennsylvania 19103

11. AWWA American Water Works Association, Inc.
666 Quincy Street
Denver, Colorado 80235

12. BUMINES Publications Section
U.S. Bureau of Mines
4800 Forbes Avenue
Pittsburgh, Pennsylvania 15213

13. CALIF State of California
General Services Publications
P.O. Box 1015
North Highland, California 95660

14. CGA Compressed Gas Association, Inc.
500 Fifth Avenue
New York, New York 10036

15. CMAA Crane Manufacturers Association of America, Inc.
1326 Freeport Road
Pittsburgh, Pennsylvania 15238

16. CRC C. R. C. Press, Inc.
2000 N.W. 24th Street
Boco Raton, Florida 33431

17. DOD Department of Defense
The Pentagon
Washington, D.C. 20301

18. DNA Field Command
Defense Nuclear Agency
Albuquerque, New Mexico

19. DOT Department of Transportation
400 7th Street, S.W.
Washington, D.C. 20590

20. DOT Coast Guard
Department of Transportation
400 7th Street, SW.
Washington, D.C. 20590

21. DUPONT E.I. duPont de Nemours and Company
Petrochemicals Department
Wilmington, Delaware 19898

22. EPA Environmental Protection Agency
401 M Street, SW.
Washington, D.C. 20460

23. FDA Food and Drug Administration
5600 Fishers Lane
Rockville, Maryland 20857

24. FEMA Federal Emergency Management Agency
Administrative Services Division
Printing and Publications Branch
Room 404
Washington, D.C. 20472

25. FM Factory Mutual Engineering Division
1151 Boston-Providence Turnpike
Norwood, Massachusetts 02062

26. GPO Superintendent of Documents
United States Government Printing Office
Washington, D.C. 20402

27. GSA General Services Administration
General Services Building
18 and F Street, NW.
Washington, D.C. 20405

28. IAEA UNIPUB
P.O. Box 433, Murray Hill Station
New York, New York 10016

29. ICRP International Committee on Radiation Protection
4201 Lexington Avenue
New York, New York 10017

30. ICRU International Commission on Radiation Units and Measurements
7910 Woodmont Avenue
Washington, D.C. 20014

31. IEEE Institute of Electrical and Electronic Engineers, Inc.
345 East 47th Street
New York, New York 10017

32. IME Institute of Makers of Explosives
420 Lexington Avenue
New York, New York 10017

33. IRI Industrial Risk Insurers
85 Woodland Street
Hartford, Connecticut 06102

34. ISO International Standards Organization
c/o American National Standards Institute
1430 Broadway
New York, New York 10018

35. ITE Institute of Transportation Engineers, Inc.
Suite 905, 1815 North Fort Myer Drive
Arlington, Virginia 22209

36. MCA Chemical Manufacturers Association
1825 Connecticut Avenue, NW.
Washington, D.C. 20009

37. MCGRAW McGraw-Hill Book Company, Inc.
1221 Avenue of Americas
New York, New York 10020

38. MPD G. D. Searle and Company
Will Ross, Inc./Matties or Products Division
P.O. Box 85
East Rutherford, New Jersey 07073

39. NASA National Aeronautics and Space Administration
400 Maryland Avenue, SW.
Washington, D.C. 20546

40. NAV Commanding Officer
(Code 512) Naval Publications and Forms Center
5801 Tabor Avenue
Philadelphia, Pennsylvania 19120

41. NBS National Bureau of Standards
Department of Commerce
Washington, D.C. 20234

42. NCRP National Council on Radiation Protection and Measurement
7910 Woodmont Avenue, Suite 1016
Bethesda, Maryland 20014

43. NCUTLO National Committee on Uniform Traffic Laws and Ordinances
1776 Massachusetts Avenue, NW.
Washington, D.C. 20036

44. NFPA
National Fire Protection Association
470 Atlantic Avenue
Boston, Massachusetts 02210

45. NIOSH
Publications
NIOSH (MSR6)
4676 Columbia Parkway
Cincinnati, Ohio 45226

46. NRA
National Rifle Association
1600 Rhode Island Avenue, NW.
Washington, D.C. 20036

47. NSC
National Safety Council
444 North Michigan Avenue
Chicago, Illinois 60611

48. NTIS
National Technical Information Service
Department of Commerce
Springfield, Virginia 22151

49. NWU
Traffic Institute
Northwestern University
405 Church Street
Evanston, Illinois 60201

50. OMB
Office of Management and Budget
Old Executive Office Building
17th and Pennsylvania Avenue, NW.
Washington, D.C. 20503

51 OSHA
OSHA Publications Office
U.S. Department of Labor
Room S1212
3rd Street and Constitution Avenue, NW.
Washington, D.C. 20210

52. UL
Underwriters' Laboratories, Inc.
207 East Ohio Street
Chicago, Illinois 60611

53. USDA
Department of Agriculture
Washington, D.C. 20250

54. USPHS
Public Health Service
Office of Public Affairs
100 Independence Avenue, SW.
Room 7406
Washington, D.C. 20201

Table 3. DOE-ORO APPRAISAL RATINGS FOR ES&H PROGRAMS

Appraisal Dates	Rating
Environmental Management	
8/9-11/83	No report has been received. No rating was given during the appraisal.
6/28 - 7/2/82	Excellent
8/18-21/81	Excellent
8/19-8/22/80	Excellent
5/2-4/79	Excellent
5/8-10/78	Superior
6/6-8/77	Excellent
6/16-17/76	No rating given. The appraisers wrote: "The environmental protection program continues to be effective despite manpower and funding restrictions."
8/26-28/75	No rating given. This observation was made in the appraisal report summary: "Environmental Protection matters continue to be pursued in a conscientious manner despite apparent manpower deficiencies."
Health Physics	
9/20-23/83	Satisfactory
6/2-11/82	Satisfactory
10/7-10/80	Poor
8/2-4/78	Excellent
1/27-28/77	Satisfactory
6/30-7/3/75	No rating given. The program was described as adequate.
Industrial & Construction Safety	
11/26-30/84	No rating given.
4/19-21/83	Excellent
9/28-30/82	Excellent
2/10-13/81	Excellent
6/18-22/79	Satisfactory
8/30-9/2/77	Satisfactory
9/27-10/1/76	Satisfactory
9/8-12/75	Satisfactory

Table 3. DOE-ORO APPRAISAL RATINGS FOR ES&H PROGRAMS (Continued)

Appraisal Dates	Rating
Industrial Hygiene	
10/12-14/83	Excellent
6/2-11/82	Satisfactory
9/15-18/81	Satisfactory
9/14-15/76	No rating given
6/30-7/3/75	No rating given. All ES&H programs considered adequate.
Emergency Preparedness	
6/84-8/84	No report received. No rating given during appraisal.
12/1-4/81	Low Excellent
4/28-5/1/80	Superior
8/23-25/77	Satisfactory
6/24-25/75	No rating given
Facility Safety	
5/22-23/84	No report received. At the closeout, the appraisers characterized NLO performance as excellent in Nuclear Criticality Safety and Transportation Safety.
6/28-29/83	NCS and Transportation Safety rated superior.
2/9-10/82	NCS and Transportation Safety rated superior.
4/5-6/77	No rating given. Satisfactory NCS controls were noted.
2/24-25/81	NCS and Transportation Safety Program rated excellent.
11/7/75	No rating given but the appraisers considered that the NCS and Transportation Safety programs were considered in compliance with ERDA requirements.
11/19-20/74	No rating given but NCS controls and procedures were "adequate and within the provisions of AEC and OR-0530."
Fire Protection	
6/11-15/84	Excellent
6/28-7/2/82	Appraisal conducted by Professional Loss Control, Inc., for DOE. No rating given.
6/16-18/81	Excellent
2/26-29/80	Superior
5/1-4/79	Excellent. Construction safety also rated excellent.
4/19-21/78	Superior. Construction safety rated excellent.

Table 3. DOE-ORO APPRAISAL RATINGS FOR ES&H PROGRAMS (Continued)

Appraisal Dates	Rating
Fire Protection (Continued)	
10/17-21/77	Excellent
5/3-6/77	Satisfactory, but approaching excellent.
10/12-15/76	Satisfactory
6/22-25/76	Satisfactory
10/7-10/75	Satisfactory
4/1-4/75	Satisfactory. Housekeeping conditions rated excellent.
Environmental Safety & Health Management	
9/28-29/83	Excellent

Table 4. RATING OF ES&H PROGRAM BY THE DOE-ORO PERFORMANCE EVALUATION COMMITTEE

Performance Period	Fire Protection	Industrial & Construction Safety	Environmental Management	Health Physics	Industrial Hygiene	Emergency Preparedness	Facility Safety(1)
FY-84, 2nd half	Excellent	Excellent	Low Satisfactory	Satisfactory	Satisfactory	Satisfactory	Superior
FY-84, 1st half	Excellent	Excellent	Low Excellent	Satisfactory	Satisfactory	Satisfactory	Superior
FY-83, 2nd half	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Superior
FY-83, 1st half	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
FY-82, 2nd half	Excellent	Excellent	Excellent	Satisfactory	Satisfactory	Excellent	Excellent
FY-82, 1st half	High Excellent	No Rating	High Excellent	Satisfactory	Satisfactory	Low Excellent	Excellent
FY-81, 2nd half	High Excellent	High Excellent	Excellent	Low Excellent(2)	Low Excellent(2)	Excellent	Excellent
FY-81, 1st half	Superior	Excellent	Excellent	Satisfactory(2)	Satisfactory(2)	Excellent	Excellent
FY-80, 2nd half	Superior	Excellent	Excellent	Poor(2)	Poor(2)	Excellent	No Rating
FY-80, 1st half	Superior	Excellent	Excellent	Poor	Low Excellent	Superior	Excellent
FY-79, 2nd half	Excellent	Excellent	Excellent	Upper Range Excellent(2)	Upper Range Excellent(2)	Superior	No Rating
FY-79, 1st half	No Rating	No Rating	Superior	Satisfactory.	No Rating	Superior	No Rating

(1) Includes Nuclear Criticality Safety, Transportation Safety, and safety analysis and reviews.

(2) Separate ratings were not given but a rating was given to the "health protection program" which has meant Health Physics and Industrial Hygiene.

Senator Glenn's Specified Area of Inquiry

2. Your view of the performance of NLO, Incorporated, in the area of health and safety at the FMPC, identifying strengths and weaknesses as you see fit.

NLO Response:

Since the first days of operation, it has been the objective of NLO, Inc. to conduct operations in a manner that did not have a deleterious effect on worker health, the health of our neighbors, or the offsite environment. While recent publicity might make it seem otherwise, the fact is that NLO has met all applicable standards for radiation exposure of workers and the general public and plans were begun several years ago to meet the anticipated new standards recently adopted by the U. S. Environmental Protection Agency (EPA) for population exposure due to airborne radionuclides.

A principal past weakness has been the slowness in recognizing that staffing which was adequate following the last large force reduction in the early 1970's would not be adequate to handle the combined effect of DOE's ES&H interest, federal and state regulations of the 1980's, and the sharp rise in the DOE production requirements. The sudden turnaround in the extent of state jurisdiction over federal facilities added more requirements for controls, recordkeeping and reporting. We believe the present staff is experienced and knowledgeable and can be expanded to meet DOE objectives regarding environmental, safety and health (ES&H) activities.

On commencement of our contract activities in 1951 and before the states had jurisdiction over environmental activities at DOE sites, NLO personnel cooperated with the State of Ohio as a matter of comity. Using state guidance, limits were established for non-radioactive contaminants in wastewater discharged to the Great Miami River soon after site operations began in the early 1950's. National Bureau of Standards (NBS) handbook recommendations were used for radioactivity limits prior to the first AEC standard. These self-imposed standards (listed in Table 5) have never been exceeded.

Present-day requirements for environmental protection require greater control efforts than were expected 30 years ago. This does not mean, however, that operations were conducted without regard for possible environmental consequences. The construction of waste lagoons is a prime example of the change. Under present requirements, a waste lagoon must have a liner, or double liner, with a leachate collection system in case the liner fails. These requirements did not exist when FMPC Pit 3 was designed and built as the first lagoon for liquid wastes but the need to protect local groundwater was recognized. To reduce the chance of migration of Pit 3 contents to the groundwater, the pit was dug into clay and clay was added where needed to form a layer several feet thick. This layer was compacted with sheepsfoot rollers, hauled back and forth across the clay with tractors. When migration was noted through the analysis of water from storage area test wells, a consultant was hired to advise on strategies that would minimize the migration. As recommended by the consultant, a nearby test well was pumped continuously to lessen migration beyond the pit area.

Dust collectors received considerable attention during the early years as efforts were made to meet production requirements while reducing airborne discharges. A sampler was designed for the dust collector stacks to monitor discharges. Personnel from several divisions worked to find collector bags which had good particulate retention and could endure the abrasion of heavy uranium dusts. When a type of bag was proven suitable, drawings were made and specifications established to ensure proper future purchases were made. Reasonable industrial practices were being followed and the resulting concentrations of uranium in air at the plant boundary were well within the DOE guides for uncontrolled areas. Seldom has the yearly average airborne uranium concentration measured at the boundary exceeded one half of one percent of the DOE limit and the average has never exceeded 17.7 of the limit. All calculations of population doses from airborne uranium showed that the doses were only a small percentage of the DOE limit for population exposures.

In 1982, when the U. S. EPA first proposed new, lower limits for population doses due to airborne emissions from DOE sites, DOE-ORO and NLO planned for the installation of additional air cleaning equipment that would endure a minimum of radionuclide emissions. Those plans were made and budget requests begun before the Plant 9 release which occurred in late 1984 and led to the present attention directed at the FMPC and DOE.

Because of a strong industrial safety program, NLO injury rates have always been lower than the rates for industries in the same National Safety Council classification. Figure 1 shows the lost workday cases per 100 employee years for NLO, all industries and the primary non-ferrous metals industries. In the four years compared on the graph, the average NLO rate is about one-fifth the average rate of the non-ferrous group.

Losses due to fire, vehicle accidents and general property damage have been low. From 1980 through 1984 there were no recordable vehicle accidents, no recordable fire losses and only $10,000 property damage (due to high winds in 1982).

Low injury and accident rates have brought numerous awards to NLO. In the thirty years from 1954 through 1983, NLO has received a total of 69 awards from the National Safety Council, Industrial Commission of Ohio, NL Industries, the Atomic Energy Commission and DOE. A list of the awards is given in Table 6.

Over the past 20 years, NLO has cooperated with DOE contractors conducting epidemiology studies. Before this, from 1962 to 1964, NLO administered the contract for an initial feasibility study which led to the conclusion that contractor medical and exposure records were adequate for worker health studies. Since 1977, NLO has provided records to the Oak Ridge Associated Universities (ORAU) for studies of NLO workers. Within the next several months, ORAU expects to complete its first NLO study and submit a report for peer review and publication in a recognized epidemiology journal.

A 1983 doctoral thesis concludes that an increased incidence of non-malignant lung disease among NLO workers is related to uranium exposure. The National Institute of Health has reviewed the thesis and has reported that it is flawed and the conclusions are not warranted.

Personnel in the NLO Health & Safety Division were instrumental in the DOE decision to establish the Uranium Registry, a group which obtains tissues of former uranium workers for laboratory analysis. This effort is needed to add to knowledge on uranium uptake, deposition and retention as it might affect the health of industry workers and the general public.

Collection of environmental samples began when plant operations first got underway. Continuous 24-hour samples have been collected from the site's wastewater discharge line since that time, with data reported to the State of Ohio for over 25 years. Sample collection was expanded. There are over 100 environmental sampling locations and 2200 samples collected annually. Many of these samples receive multiple analyses. Much of this environmental data is published in the FMPC annual Environmental Monitoring Report which is routinely distributed to ten local, state and federal groups and agencies.

Areas of weakness may best be identified by considering the reports of reviews made between April 1984 and April 1985 by three separate teams. While there is little recognition of strong points, their reports do identify areas where upgrading or improvements were considered necessary.

The first of the three non-routine reviews was the most extensive. This review was conducted by a Task Force consisting of eight DOE personnel from several DOE-ORO offices. On-site visits began May 2, 1984, continued into June 1984, and a draft report was prepared in late June. As noted in the report, the principal objective of the Task Force was to determine the capability of the FMPC to support the DOE Nuclear Materials Production Program. The Task Force concluded NLO aggressively pursued and achieved the objective of producing quality product, on cost and within schedule and NLO recognized and developed plans for eliminating several critical concerns. A general weakness in the environmental protection and waste management areas was NLO's less-than-aggressive approach toward planning to accommodate current needs. The Task Force noted that there was too much dependence on DOE-ORO for directives, guidance and solutions. NLO is carrying out, or has plans to carry out, recommendations made by the Task Force and periodic progress reports are being made to DOE-ORO.

At the request of the DOE Assistant Secretary for Defense Programs, the DOE-HQ Office of Security and Quality Assessments conducted an onsite review of the NLO health physics program. The review team consisted of more experts in the field of health physics, industrial hygiene, and medical effects. They visited the FMPC March 6-8, 1985, and prepared a draft report dated March 15, 1985. Numerous recommendations for program upgrading are given in the draft report; many recommendations were in regard to existing program elements or activities. Although the reviewers made recommendations for improving the NLO health physics program, they also concluded there was no evidence that the health and safety of any employee was jeopardized. Follow-up actions on the Team's preliminary recommendations are being planned and further appropriate corrective actions will be planned and executed when their recommendations are finalized.

In February 1985, representatives from Martin Marietta Energy Systems, Inc., Oak Ridge, visited the FMPC at DOE-ORO request to review the NLO environmental, safety and health programs. In their written reports, the visitors noted that staffing and documentation (procedures and reports) were the areas of greatest weakness. Their principal conclusions were that NLO programs were better than publicity led them to believe; present personnel were technically competent and conscientious; many of the ES&H program features were excellent; shortcomings could be corrected with increased staff and additional funding; there is no reason to suspect serious health threats exist at the FMPC. Recommendations and suggestions made by the

Martin-Marietta visitors will be given thorough consideration; some follow-up actions have been started.

In addition to the appraisals, reviews, and audits conducted routinely by DOE-ORO and the three non-routine reviews described above, there have also been several internal audits of ES&H functions conducted by private consultants. While these audits were brief, they were of sufficient depth to allow the consultants to draw conclusions about the function they were auditing. In all cases, there were recommendations for upgrading; however, in no case did the consultant indicate that the basic program was poor or in need of drastic overhaul.

Regardless of areas of weakness, it is clear that controls have been adequate to prevent harm to employees or nearby residents. Annual external radiation exposures of workers have been within standards. The employee with the highest employment whole body (gamma) dose has had an average dose of just under 1 rem per year, as compared with the DOE, NRC and OSHA limit of 5 rem per year. In vivo counting shows that only three employees out of 500 that are monitored routinely have a uranium lung burden which exceeds 50% of the permissible burden - the highest of these is 70% of the permissible limit. Based on extensive monitoring, it is clear that airborne discharges have not resulted in offsite concentrations of uranium in soil that would require remedial actions. Uranium in offsite groundwater, while undesirable and the subject of a current remedial study, does not cause current radiation exposure guides to be exceeded.

Table 5. Wastewater Standards Self-Imposed by NLO, Inc.
Prior to Issuance of Federal or State Standards

Material	Maximum Allowable Concentration (MAC)	Authority for Use of MAC
Fluoride	1.2 parts per million fluoride (F) in the river.	Verbal communication from Waring to Yoder. Trip report of visit to Department of Health, Columbus, Ohio January 26, 1955.
Nitrate	44.0 parts per million nitrate (NO_3) in the river.	Report of the Water Pollution Study of Miami River, Ohio Department of Health, 1951
pH	Lower Limit 6.3, Upper Limit 9.0 as measured in effluent.	Same as above.
Oil	Essentially none. (Our interpretation of this is that there should be no visible oil in the effluent.)	Same as above.
Settleable Solids	Substantially complete removal. (Our interpretation is <.1% by volume of settleable solids in the effluent.)	Same as above.
Alpha Activity	Total (other than the uranium) 10^{-7} microcuries per cubic centimeter in the river.	National Bureau of Standards, Handbook 52
Beta Activity	10^{-7}microcuries per cubic centimeter	Same as above.
Radium	4 x 10^{-8} microcuries per cubic centimeter	Same as above.
Color, Odor, Taste, other toxic or deleterious material, high temperature.	None, which would be objectionable. (Our own interpretation)	

Table 6. Safety Awards Received by NLO, Inc.

Year	Agency	No. of Awards	Type of Award
1954	AEC	1	Award of Merit (1,280,282)
1955	AEC	3	Award of Merit (1,138,269) (1,064,317) (1,711,573)
	NSC	2	Award of Merit (1,054,317) (1,711,573)
	ICO	1	Group Safety Award
1956	AEC	2	Award of Merit (2,072,699) (2,230,329)
	NSC	2	Award of Merit (2,072,699) (2,230,329)
1957	AEC	2	Award of Merit (1,357,866) (1,101,055)
	NSC	2	Award of Merit (1,101,055) (1,357,866)
1958	AEC	2	Award of Merit
	NSC	1	Award of Merit
	NSC	1	1st Place - Metal Section Safety Award
1959	AEC	2	Award of Merit (1,213,460) (2,388,083)
	NSC	4	Award of Merit
	NSC	1	1st Place Metal Section Safety Award
1960	AEC	2	Award of Merit (1,163,591) (2,405,052)
	NSC	4	Award of Merit
1961	AEC	1	*Award of Honor (4,558,258)
	NSC	1	*Award of Honor (4,558,258)
	ICO	1	Achievement Award
1963	NSC	1	Fleet Safety - Perfect Record Award
	ICO	1	Group Safety Award
1964	AEC	1	Award of Merit (2,224,942)
	NSC	1	Winner National Fleet Safety Contest
	ICO	1	Achievement Award
1965	ICO	1	Special Achievement Award
1966	AEC	1	*Award of Honor (3,899,830)
	NSC	1	*Award of Honor (3,899,830)
1967	NSC	1	Fleet Safety - Perfect Record Award
1968	ICO	1	Award of Merit
	ICO	1	Award of Merit
	ICO	1	Special Achievement Award
	NSC	1	Fleet Safety - Perfect Record Award
1969	NSC	1	1st Place - Metals Section Safety Contest
	NSC	1	Fleet Safety - Perfect Record Award

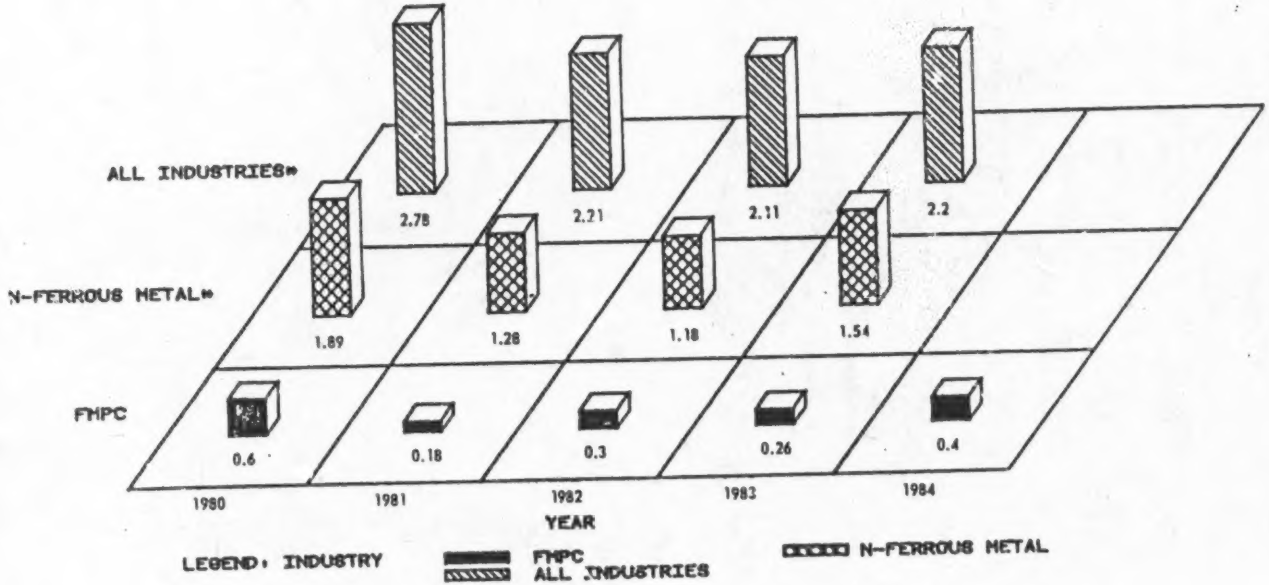
Year	Agency	No. of Awards	Type of Award
1973	NSC	1	Fleet Safety - Perfect Record Award
	NLI	1	Division Award - Safety Achievement
	NSC	1	Fleet Safety - Perfect Record Award
1974	NSC	1	Fleet Safety - Perfect Record Award
1975	DOE	1	Award of Honor
	ICO	1	Special Merit
	NSC	1	Fleet Safety - Perfect Record Award
1976	NSC	1	1st Place - Metals Section Safety Contest
	NSC	1	Award of Merit (2,446,574)
	NSC	1	2nd Place - Fleet Safety Contest
1977	NSC	1	1st Place - Metal Section Award
	NSC	1	Fleet Safety - Perfect Record Award
1980	DOE	1	Award of Excellence
	NSC	1	Fleet Safety - Perfect Record Award
1981	NSC	1	Award of Merit
	NSC	1	Fleet Safety - Perfect Record Award
1982	NSC	1	Award of Merit
	NLI	1	Company Award for Lowest Disabling Injury Rates
1983	NSC	1	Award of Honor*

Code:
NCS - National Safety Council
ICO - Industrial Commission of Ohio
NLI - NL Industries
DOE - Department of Energy
AEC - Atomic Energy Commission

FIGURE 1

COMPARISON OF INJURY RATES

Lost Workday Cases Per 100 Employee/Years



* 1984 NATIONAL SAFETY COUNCIL STATISTICS AVAILABLE IN NOVEMBER, 1985

Senator Glenn's Specified Area of Inquiry

3. NLO Management Characterization of the Relationship Between Management and Labor at the FMPC, and the effect of worker concerns about occupational health and safety on that relationship.

NLO Response:

NLO Management's philosophy and general attitude toward relations with the employees may be best described by quoting the Bargaining Agreement, Article I, Section 2, Purpose:

> The purpose of, and consideration for, this Agreement is to provide orderly relations between the Company and the Union, to secure prompt and equitable disposition of grievances, and to establish fair wages, hours, and working conditions for the employees in the bargaining unit.

The above language, agreed to by the parties to the Agreement, has formed the framework of the Company's goal in industrial relations.

As Operators of the FMPC for the U. S. Government, we have also carried out the desires of the DOE to maintain orderly relations with the Union and employees and to provide a safe work place.

This philosophy and attitude has been properly implemented and the relationship between Management and Labor at the Feed Materials Production Center has been generally good. There have been differences but these have been no greater and probably less in both number and severity than those experienced in most large industrial facilities. It is recognized that perceptions of this relationship vary among our employees and with some employees is highly subjective. These perceptions are strongly influenced by individual experiences and by major events which impact on the FMPC. This is particularly true of the more recent events. Certainly whatever differences that may have existed between NLO Management and the Union have been exacerbated by the events of the past four months. In particular, workers who have grievances against Management must have had certain of those grievances reinforced and doubts cast in the minds of many others, by the criticisms of Management which have been made public and/or have appeared in the news media. This is true even in the cases of criticism involving distortion of fact.

It is also recognized that Management perceptions of industrial relations may be subjective. It is therefore important that a factual basis be determined to minimize subjective feelings and to provide as much objectivity as possible in the evaluation of the relationship. No completely objective method is possible but there are certain definable and measurable factors which can be used to objectively gauge management-labor relations at any industrial facility. These include the following:

1. Number and severity of work stoppages by employees.
2. Employment turnover rates and the relative number of long-term employees.
3. Number of those applying for employment and the ratio of applicants to job openings.
4. Willingness of employees to recommend their place of employment to others and in particular, to close friends and relatives.
5. Difficulty and length of management-labor contract negotiations.
6. Participation of non-management employees in Company-sponsored activities along with management employees.
7. Number of employee grievances.

Each of these factors, when properly examined and evaluated, strongly supports our contention that the labor-management relationship at the FMPC is good.

The quality of the management-labor relationship can usually be characterized by the number and severity of work stoppages, ranging from full-fledged strikes to job walkouts by selected groups of employees. The FMPC workers have always been represented by a Council comprised of AFL-CIO unions each with the support of their international unions. Yet remarkably enough, the last strike at the FMPC was almost 19 years ago in 1966. Furthermore, during that entire period, there was exactly one walkout affecting only a few employees and of short duration in 1969. A record of one strike and one walkout over a 19-year period is an excellent record by any standards.

Employment turnover rates are another barometer of labor-management relations. The national industrial turnover rate has averaged about 12% over the past five years.

The FMPC turnover rate has averaged 7.7%; however, the large number of retiring employees at the FMPC over the past five years inflated this rate. If retirements are excluded, the FMPC turnover rate is only 3.9%. The FMPC turnover rate adjusted for an average retirement rate is probably less than one half the national average, a fact which hardly suggests an unusually high degree of worker dissatisfaction.

Labor-management relationships usually deteriorate when the employees consider their place of work to be oppressive or hazardous. That consideration is usually communicated to the surrounding community with the effect that applicants for job openings are limited. That is hardly the case at the FMPC. Since 1981, about 1200 job vacancies have appeared at the FMPC. There have been over 42,000 applicants for those jobs. An average ratio of 35 applicants for every opening does not indicate a widespread perception of the FMPC as a poor place to work for any reason. So far in 1985, in the aftermath of publicity surrounding the releases of November-December 1984, we continue to have multiple applicants for each job opening and our turnover rate remains far below the national average.

It is also instructive to examine the identity of many of the FMPC workers and their relationships to other workers. At the present time, 203 out of 1083 FMPC workers are from the same families. Of those, 106 are wage employees. In addition, there were 29 other workers with close family relation to present employees who have retired, resigned, or otherwise left FMPC employment during the past five years. So large a ratio of related employees is an indication of high employee job satisfaction and good employee relations. In most cases the older employees referred sons, daughters, and other relatives and encouraged them to seek employment at the FMPC. Union officials have been particularly conspicuous by the number of their family relatives employed at the FMPC. Company records indicate that a total of 68 Union officials past and present had relatives working at the FMPC. The present Union president has a son working as a wage employee. His predecessor has two brothers and a son working as wage employees at the FMPC. His predecessor, in turn, at one time or another, had a daughter, a brother, and a grandson employed at the FMPC. The high incidence of employed relatives to wage employees and Union officials hardly supports the contention that the majority of the bargaining unit members or other employees considers the FMPC to be an oppressive or hazardous place to work.

There has been no indication of poor relations in recent Company-Union contract negotiations. Not only has there been no strike in the past 19 years, there has been no serious threat of strike as the result of Company and Union negotiators having difficulty in arriving at mutually acceptable agreements. Indeed, in no instance over this period was it necessary to extend a contract in force to provide for extended negotiations resulting from a prolonged inability to reach an agreement. These relatively harmonious and expedient negotiations have not reflected any great degree of dissatisfaction over working conditions.

Individual relations between management and non-management personnel have also been relatively good. Both participate together in a wide range of non-work Company activities including social events, athletic leagues, and other affairs. A prime example is the two Company bowling leagues which contain the largest number of participants in a Company-sponsored non-work activity. There are a total of 149 participants in these leagues. Eighty are wage employees, 26 are non-exempt salaried employees and 43 are exempt employees. Participation ranges from laborers to the highest levels of management. Relations are harmonious with a good deal of camarderie expressed. Similar relations exist in other non-work Company-related activities.

Grievances are, of course, filed at the FMPC. Last year a total of 97 grievances were filed by 72 employees. This represents an average of about one grievance for every six wage employees. By normal industry standards, this is not a bad record. It is, for example, somewhat better than the records for the two other nearby DOE installations doing similar work and having similar grievance procedures. At one of these, the ratio was one per three employees and at the other, the ratio was one per 4.5 employees.

The effect of worker concerns about occupational health and safety on the labor-management relationship was not a major factor prior to the series of events which began with the disclosure of the Plant 9 dust collector losses on December 7, 1984. This is reflected in the fact that safety-related grievances were only a small percentage of those filed. For example, only eight of the 97 grievances filed in 1984 were concerned with health and safety issues. Obviously in 1985 there has been considerably more discussion of worker health and safety but most of this has emanated from the Union leadership. Rank and file concerns do not appear to be any greater. In actual fact, the percentage of grievances which can be identified as health and safety-related has declined. Only two of the 29 grievances filed to date in 1985 are health and safety grievances. Concerns for better health and safety protection have, of course, been expressed in Company-Union safety meetings but expressions of these concerns are the primary purpose of the meetings. We have not detected any groundswell of popular concern over health and safety matters. Indeed, in some of the regular meetings with hourly employees, it has been necessary for supervision to provoke discussions of important health and safety issues.

Our perception that management-labor relations at the FMPC are generally good has been challenged by the current Union leadership. We believe that the facts we have stated effectively refute that challenge. Furthermore, we do not believe that the Union's assessment represents an accurate consensus of the views of their members. This is entirely possible given the makeup of the Union. The organization of the Fernald Atomic Trades and Labor Council (FATLC) is so constituted that a relatively few members can and sometimes do exert disproportinate control over its policies. The fact is that five percent of the workers control almost 40% of the Council vote. The FATLC is comprised of 15 active locals, each with two votes in the Council. (An exception is the Chemical Workers local with three votes.) Some of these locals have large memberships, e.g., the Chemical Workers local has 215 members but six locals have 12 or fewer members each. Indeed, all six of these have a combined membership of only 30 workers but a total of 12 of the 31 Council votes. In actual fact, the maintenance craft locals, aligned with several others locals, usually dominate the Union Council. They elect the Union officers (the officers are elected by Council vote, not by total membership majority vote) and they determine its major policies.

We perceive that a majority of the Union members believe that the Company has dealt honestly and fairly with them. Many of these have expressed their support, both individually and in groups. They have approached management people directly to express their support and some have written letters to newspapers supporting Management. Three Union groups have taken the extraordinary step of writing letters addressed to the Union Council, protesting the official FATLC view of the current istuation. These groups were the Teamsters Local 100, the Industrial Mechanics of the IAM, and the Building Service Employees Local 158A.

It should be recognized that the current public and worker perceptions of the DOE and NLO responses to health, safety and environmental concerns have been influenced by larger national agendas for dealing with such concerns. During the past decade, public and workers awareness of perceived hazards have increased. In many cases, including the FMPC, it has been difficult to respond as rapidly as workers and the public would like.

In summary, we believe that there are simply no indications of a deteriorated labor-management relationship at the FMPC other than the subjective contentions of some Union officials to the contrary. No definable, measurable standards of a poor general relationship are apparent. As we have pointed out earlier, all the usual indicators point to a good relationship. There have been and still are areas of discontent and disagreement. We have tried and will continue to try to understand and to respond to legitimate labor concerns.

Senator Glenn's Specified Area of Inquiry

4. NLO Management Recommendations on Improving Labor-Management Relations and Improving the Operations of the Plant so as to Meet the Concerns of Workers and Citizens Living in Nearby Areas.

NLO Response:

NLO Management recognizes the need to improve existing relationships with Union leadership at FMPC. It should be emphasized that Management views relations with all employees at FMPC as highly satisfactory on a continuing basis. The dichotomy of relationships suggested by the foregoing reflects two principal and related conditions:

1. Union leadership is supporting new Federal legislation covering health and safety measures in the uranium industry and, in furtherance of that goal, has made public statements reflecting conclusions which Management finds at variance with the facts.

2. Union leadership has publicly alleged that NLO has deliberately distorted monitoring results; has used inappropriate health and radiation standards; and has failed to protect the health of Fernald employees. The Company categorically rejects these charges as being untrue.

Amelioration of relations with Union leadership at FMPC will require honest efforts by both parties. Management believes this improvement is not only possible but obviously desirable. Its accomplishment and endurance, however, require not only a mutual effort but an effort based upon open, honest dealings with one another.

Similarly, public concerns have been based on information which has frequently been either incorrect or else structured in such a manner that significant distortions of true circumstances are accepted as accurate.

Any improvement in labor-management relations at the FMPC hinges upon labor's faith in the credibility of NLO, Inc. and the Department of Energy, and their officials. Most public pronouncements by the Union leadership since early December have proclaimed a disbelief in the integrity of NLO, Inc. and DOE.

4. (Cont.)

In order to attempt to improve avenues of communication with Union officials, a meeting was held on February 21, 1985, to discuss Union-Management problems. The Union discussed orally, and later submitted in writing, some six requests for action by NLO, Inc. and an additional four requests that were addressed to NL Industries, Inc. The requests of NLO, Inc. were answered in a letter from R. M. Spenceley, Manager, to E. G. Branham, President FATLC, dated March 14, 1985. Similarly, NL Industries, Inc. responded to the four requests addressed to them in a letter from J. B. Chaney, NL Industries, Inc. Site Representative, to E. G. Branham, President FATLC, dated April 4, 1985. More specific follow-up meetings will be held in the next few months. In addition, routine advisories will be addressed to all employees detailing plans and progress in solving problems. In the past five years - 1980 through 1984 - NLO, Inc. has published a total of 199 employee bulletins covering a wide range of subjects including safety and health. This is an average of 37.8 communications per year, or three per month, and does not support the contention that NLO, Inc. does not communicate information to its employees.

The Union has indicated a desire to become more involved in health and safety activities. The Company has responded by increasing the frequency of the Company-Union Safety Meeting from quarterly to monthly and by increasing the time allotted for each by 67%. In addition, the Company responded favorably to a Union request to bring in their own health-physicist to monitor the reduction operation in Plant 5. He was present on site on March 1, 1985, and was accorded full cooperation by all personnel.

To remove any appearance of secrecy surrounding the FMPC, plant tours are planned for late spring and early summer. High on the list of attendees will be the families of NLO, Inc. employees. By this means we hope to dispel concerns of employee families as to working conditions and health-safety practices at the FMPC. Further, family awareness of the importance of the work being performed by husbands, wives, sons and daughters should reinforce pride in their jobs on the part of NLO, Inc. employees.

NLO, Inc. has always espoused an open door policy for all employees. Concerns and problems which are seemingly stalled can and have been discussed directly with upper management. It is also NLO, Inc.'s intent to foster improved communications between first line supervision and the hourly employees in an attempt to establish a greater rapport between the two groups. A training program for supervisors to accomplish this end is currently being implemented.

4. (Cont.)

of all new dust collector installations. These secondary filters will provide additional safeguard against significant air emissions.

The need to locate and abate the source of uranium found in three off-site wells is of utmost importance. The level of uranium in these three wells falls significantly below the DOE limit. Nevertheless, presence of elevated uranium concentrations has caused much consternation among nearby residents. Prompt remedial action is a necessity and is underway. These efforts started in 1981 when the presence of uranium in off-site wells was first detected. The Ohio EPA, the Ohio Department of Health, DOE and well owners were all notified of the problem. Results of well samplings were routinely submitted to all of the above. A hydrological study by the USGS was funded. When results of this study failed to determine the probable source of the uranium, the firm of Dames and Moore was hired to conduct a second hydrological study. This study is scheduled for completion in mid-May. This survey is chartered to discover the probable source of the uranium and to recommend remedial measures to eliminate that uranium. One possible source of the uranium will be eliminated with the completion of a storm water holding basin now under construction as a portion of the Water Pollution Control project #83-D-146. This project was funded for start in FY-83 with completion in FY-86. At present, during periods of heavy rainfall, the excess of water which cannot be handled by the lift station overflows to a natural drainage ditch which empties into Paddy's Run, a small creek on the west boundary of the FMPC which drains to the Miami River. The new retention basin will collect this overflow and permit recirculation to the General Sump for reclamation of any uranium values present or other treatment. Any additional remedial actions will follow quickly upon receipt of recommendations contained in the Dames & Moore report.

The retirement of and removal of contaminated material from, the six in-ground Waste Pits must be effected. Action has started. There have been no liquid wastes deposited in Waste Pit 5 since December 12, 1983. Water is routinely pumped through this Waste Pit but it has no solids content. Effective in mid-March 1985, the disposal of all residues in Waste Pit 6 was halted and that in Waste Pit 4 was limited to graphite, construction rubble and asbestos. Wastes previously disposed of in these Waste Pits are now being drummed for eventual processing and transfer to permanent disposal sites. The material currently contained in Waste Pits 1 through 6 will be removed in the future and reprocessed by filtering, drying, and containerizing with ultimate disposition at a permanent disposal site. A considerable

4. (Cont.)

effort is underway to develop a process whereby the bulk of all wastes can be consumed by internal recycle, thus eliminating the need for both on-site and off-site disposal.

The presence of so-called K-65 residues in two above-ground silos has also been a cause for concern. The total quantity of material in the two silos is 8,800 metric tons. Included in this total are 11.2 metric tons of uranium and 3.64 pounds of radium. The contained radium evolves radon gas. This radon gas very slowly seeps through the concrete roofs of the two silos. Radon monitors at the plant boundary record radon levels of approximately one picocurie per liter, only one-third of the established limit of three picocuries per liter. It is proposed to construct concrete roofs above the existing roofs of these two silos. The new roofs will be capable of supporting 4-6 feet of earth cover. This proposal has two benefits: (1) It protects against accidental or intentional breaching of the silos, (2) It slows the movement of evolved radon gas sufficiently so that it decays to solids which are deposited where formed and, thereby, eliminates any threat of escape.

To prevent occasional violations of our National Pollutant Discharge Elimination System (NPDES) permit for heavy metals hexavalent chromium and copper (Cr^{+6} and Cu) and routine violations of the permit for nitrates, the Water Pollution Control project begun in 1983 is intended to destroy the nitrates by means of bacterial attack. This will be accomplished in four large reactor towers using a bacterial strain that feeds on methanol. In addition to converting the nitrates to an innocuous biomass, there is preliminary evidence that heavy metals are at least partially removed. Whether or not, an integral part of this biodenitrification system is an extremely large holding basin. Its purpose is to store feed for the biosystem so as to level out peaks in the generation of nitrates. This large holding basin will also have the effect of leveling out pumping to the river. In so doing, we can better control the discharges of heavy metals in order to stay within our NPDES limits. This project will be completed in 1986.

Extensive programs are being implemented to keep nearby residents better informed concerning activities at the FMPC. To achieve this result, a private concern under contract to DOE - Science Applications International Corporation (SAIC) - has been retained by NLO to enhance our community relations program. To interface with SAIC, a new Communications Manager has been added to the NLO, Inc. staff. Plans include

4. (Cont.)

the distribution of periodic news letters to our employees and the public, the formation of plant tours, community relations presentations to local schools, civic clubs and other interested groups. In addition, an advisory committee of five professionals, plus four lay people, including local residents, is being formed. This latter group is to "contribute to the environmental efforts of the FMPC by providing independent issues, programs and policies." It is also the intent of NLO, Inc., and of DOE, to hold frequent, open meetings with local residents to address their concerns and to exchange information.

CORRECTIONS AND AMPLIFICATIONS
TO THE TESTIMONY OF ROBERT M. SPENCELEY
BEFORE THE SUBCOMMITTEE
ON ENERGY, NUCLEAR PROLIFERATION AND GOVERNMENT PROCESSES
ON APRIL 22, 1985

SUPPLEMENTAL STATEMENT

During the field hearing on the Feed Materials Production Center (FMPC) on April 22, 1985, Robert M. Spenceley, manager of NLO, Inc., the government contractor, agreed to provide answers to questions for which he did not have the information at the hearing. There was also one statistical error in the written testimony submitted by Mr. Spenceley.

In addition, we requested permission to include another statement containing additional comments, answers and rebuttal to the testimony of some witnesses who followed Mr. Spenceley. Permission to include an additional statement was granted by Ms. Valerie Olsen, your subcommittee staff member, to our Washington representative. In your letter of April 29, you said that you may want to submit more questions to NLO, Inc. Perhaps this statement will clear up those questions.

The additional answers to Senator Glenn's questions, the corrections for the written testimony and the comments and rebuttal to the testimony of subsequent witnesses are included in this statement.

CORRECTIONS AND CLARIFICATIONS

1. Senator Glenn asked about the overall rating of FY-1979 or when the "poor" health physics rating was given. Mr. Spenceley did not

have the information, but promised to provide it.

ANSWER: The rating for that period came in 1980. The overall company performance rating was "excellent". The functional health and safety rating was also "excellent".

2. Senator Glenn asked when the High Efficiency Particulate Air Filters would be installed. Mr. Spenceley said it would be July, 1985.

   The July date was based upon sole source procurement of filters designed by NLO. DOE has ordered a review of the design and of the procurement sources. The revised installation date is now September, 1985.

3. Senator Glenn asked if the NLO medical records would be made available.

   These records belong to DOE which requires that they be permanently retained. Accordingly, the records will be turned over to the new contractor.

CORRECTIONS TO WRITTEN TESTIMONY

1. In Section 2, Page 2, 3 lines from the bottom, Senator Glenn's copy of prepared testimony had the figure 17.7%. The correct statement should read: " . . . has never exceeded one (1) percent of the limit since the boundary sampling began in 1971." Prior to 1971, monitoring was done within the production area.

COMMENTS AND REBUTTAL

In our opinion, the testimony regarding radiation dosage during the hearing was extremely confusing because of the highly technical aspects of the subject, the controversial assumptions used in "models" calculating dosage and dispersal from emissions and the widespread misunderstanding of the entire matter.

We contend that Senator Glenn's staff members used the wrong figures in their calculations. We now know the Glenn staff was taking EPA dosage standards of 75 millirems per year to the lung that will not become effective until May 7, 1985, and applying those standards to releases that occurred 30 years ago. This is a misleading comparison, at best, and because incorrect assumptions by EPA were incorporated in the comparison, it produced greatly exaggerated dosage levels.

The printed version of Senator Glenn's remarks contains a table of radiation doses calculated by the EPA for Senator Glenn. These doses are the lung doses that EPA claims would have been received from airborne uranium by a person living 810 meters northeast from the center of the production area. For 1956 releases, EPA shows a lung dose of 9,352 millirems. In the remarks, Senator Glenn notes that 9,352 millirems is about 125 times the EPA lung dose limit of 75 millirems which becomes effective in 1985. However, he is incorrect in stating that the 1956 dose figure is nearly twice the present occupational limit. The present occupational limit for lung radiation dose is 15,000 millirems and the EPA-reported figure of 9,352 is about two thirds of this dose.

- Senator Glenn declared the 1956 lung dose calculated by the EPA was equivalent to 460 x-rays. That declaration is valid only if the EPA calculated dose of 9,352 millirems is valid. EPA based its estimate of the 1956 dose on calculations used to obtain a dose of 88 millirems for the 1981 emissions, and we have disagreed with the U.S. EPA about assumptions used in these calculations. According to the U.S. EPA, the maximally exposed offsite resident lives 810 meters northeast of an assumed central release point. This EPA-selected spot is well within the plant boundary and the closest resident actually lives a considerable distance from the spot. Therefore, the 88 millirems is an exaggeration of the dose to the maximally-exposed person and any other dose based on or derived from the same assumptions is also an exaggeration. In fact, the EPA branch which made the original dose determination has informed DOE-OR that a new determination using a corrected model will be lower than their initial estimate of 88 mrem.

Employing the same computer model used by the U.S. EPA, the Oak Ridge National Laboratory calculated a 20 mrem lung dose received by the person maximally-exposed to the 1981 airborne uranium emissions. On this basis, the 1956 release would be equivalent to a lung dose of 2,125 mrem or about 106 chest x-rays. Of course, these calculations are derived from dose factors which become effective May 7, 1985. Prior dose factors recommended by radiation advisory groups and accepted by the U.S. Government give a lower dose. In the short time available, we could not learn which factors were used in 1956. However, factors widely used in 1981 show that the 1956 release of 21,043 kg. would have produced a lung dose of 720 mrem to the maximally-exposed offsite individual, using the U.S. EPA model and the EPA assumptions. This is equivalent to 36 x-rays.

In equating uranium lung doses with x-rays, it is assumed that one x-ray delivers a dose to the lungs of 20 mrem. In 1956, the average dose per x-ray was much higher and figures of 80 mrem and higher were used. If an average of 80 mrem per x-ray is assumed, the lung dose of 720 mrem is equivalent to 9 x-rays.

It must be understood that all of these estimates using the U.S. EPA model are exaggerated because of the assumption that all of the released material, in all years, was in the form of respirable particles. Our data, however, shows that only 3% or less is respirable. Therefore, the dose estimates using the U.S. EPA model, could be ten times (or more) greater than the true dose and the comparison with x-rays could be high by a factor of ten or more. Our actual field sampling since 1957 has never shown off-site concentrations that would produce the doses resulting from the U.S. EPA model.

In summary, we believe that Senator Glenn's remarks on the radiation dosage exposure to nearby residents was based on conclusions which were both factually and statistically incorrect. Unfortunately, the erroneous conclusions incorporated in the remarks greatly exaggerated the dosage exposure.

DEPARTMENT OF ENERGY RATINGS

Another area upon which testimony was taken which requires clarification is the procedure DOE uses to rate the performance of NLO. We are rated in several different areas, such as operations, quality, health and safety and environment, to get an overall company rating.

It is entirely possible to get a "poor" health physics rating and still receive an excellent or superior rating in health and safety and in overall company performance. An analogy would be missing one answer out of several on an exam. One's overall score would still be good.

It should also be emphasized that many of these reports are "exception" reports, where the rating team does not mention areas where we have good marks. Positive findings are not enumerated, and negatives only do not constitute a rating.

The DOE teams that come to the FMPC for appraisals are composed of professional people who are experts in their fields. Using well-defined protocol, they compare each area against optimal standards for that area.

The perception that we received "excellent" and "superior" ratings while doing a bad job is absolutely wrong. We earned the ratings received, both functional and overall, due to our measured performance.

REBUTTAL TO UNION TESTIMONY

The comment by Mr. Geoffrey Sea and Mr. Gene Branham of the Fernald Atomic Trades and Labor Council that employees have been brought into the plant in the prone position to "clock in" and then returned home to avoid a lost workday injury is untrue. The definition of a "lost time injury", as described by Mr. Sea, is inaccurate and incomplete.

NLO has never brought a seriously injured or ill employee to work, whether in the "prone" position, in a wheel chair, using a walker, etc., to clock in for the purpose of avoiding a lost workday injury. All injuries are evaluated and recorded in accordance with the requirements of DOE Order 5484.1, "Environmental Protection, Safety, and Health Protection Information Reporting Requirements." These requirements follow the rules as set down in OSHA 1904 "Injury and Illness Reporting Requirements." Injury statistics are published monthly and are issued to supervisory personnel for use in monthly safety meetings and to all union safety representatives, including the President of the Union. In addition, the annual statistics reporting to DOE-ORO, Safety and Fire Protection Branch are posted at the turnstiles, in the men's locker room and in the women's locker room. They are also reported to the National Safety Council.

Injury statistics do not come under Security Classification Requirement. Every reported injury, no matter how small, is investigated to determine if an injury actually occurred, if an occupational accident or illness was involved, and if so, the cause of the accident and the action necessary to correct unsafe conditions noted. As part of this investigation, employees claiming time off with questionable injuries are required to be examined by the company-appointed physician. The results of these investigations are made a part of each individual's injury records.

The agreement between NLO, Inc. and the Fernald Atomic Trades and Labor Council uses as a reference the American Standards Association, now called ANSI, and the Workman's Compensation Law of the State of Ohio to determine eligibility for payment of disability. In accordance with ANSI, employees claiming injury must be examined by a company-appointed physician (ANSI, Paragraph 1, 5, 1.5).

The physician places medical restrictions on the employee in accordance with the extent of the injuries observed during the examination. These restrictions are given to the employee's supervisor to determine if a regulary established job exists which the employee can do within the limits of the medical restrictions. If such a job is available, it is offered to the employee. If no job is available, the supervisor sends the employee home and a lost workday injury is recorded in accordance with DOE-OSHA reporting requirements.

Mr. Branham's comment concerning NLO's failure to act on safety suggestions made at safety meetings by union members is also untrue. Minutes of safety meetings in individual plants and company-union safety meetings clearly show the suggestions made and the action taken by company supervisors.

Union complaints about too little individual contact between craftsmen and their supervisors are specious. One-on-one communication is not in the purview of the union, and it is not a union function.

The accusation that company supervisors have threatened the lives of union members is an old charge that has never been proven or documented. NLO requested an independent investigation of this allegation. As a result, the DOE Inspector General has made an investigation. We have not yet been informed of the result.

SUMMARY

This company has a good record for our 34 years of operating this facility. It is a good record for production, as Senator Glenn noted. It is also a good record for health and safety and for environmental controls.

We have recently been informed that the employees of NLO will receive the Award of Honor, the National Safety Council's highest award, for efforts in the area of industrial safety for 1984. This is the second time in succession and the fourth time in the history of the plant's operation that the employees have received this award.

In the most recent D.O.E. review of our health and safety programs in February, the report said there was "no reason to suspect that serious health threats exist at the FMPC." There is nothing that substantiates this operation being a threat to the health and safety of our workers or our neighbors. There has yet to be any substantiation of harm from FMPC to any individual or to the environment.

The U.S. EPA and the Ohio EPA receive annual FMPC environmental reports and have been receiving these reports for twelve years. Neither agency ever reported to NLO or to D.O.E. that these reports indicated poor environmental management until March of 1985, after the recent publicity.

Just as we always have, this company is still managing the FMPC in compliance with all applicable federal standards. We don't oppose new or better standards. We only ask for the funding to make the changes and improvements that may be necessary to meet these standards.

We repeat our earlier statement that the number one problem at the FMPC is the physical condition of the plant.

We thank you for the opportunity to provide this supplemental statement, and stand ready to cooperate with all concerned in an effort to make FMPC all it can and should be.

NLO RESPONSES TO WRITTEN QUESTIONS

1. How is NLO currently storing new waste?

RESPONSE:

Low-level radioactive waste slurries are neutralized, settled, and filtered, and the resulting solid waste filter cakes drummed for interim storage on paved waste storage pads. Dry solid wastes are drummed directly for interim storage on the paved pads. Low-level radioactively contaminated cutting and cooling oils are drummed for interim storage on a paved pad at the waste oil incinerator where they are eventually burned. Low-level radioactive/hazardous mixed wastes are stored in diked stainless steel tanks or in drums in covered drum storage areas meeting RCRA requirements for storage facilities. Contaminated scrap metal from demolition and removal of old equipment is stored on the existing scrap metal pile. Low-level radioactively contaminated construction rubble, asbestos, and scrap graphite are three waste types not readily drummed. These three wastes are still discarded in the remaining space in Pit 4.

2. What storage improvements are budgeted for FY 1985 and 1986? Are additional improvements being considered?

RESPONSE:

Budgeted in FY 1985 are a new Waste Storage Pad, improved Loading/Handling Facilities for interim handling of waste drums prior to shipping, and Pit Area Surface Drainage Improvements. Improvements budgeted for FY-86 include Pit Stabilization to minimize surface water infiltration, Pit Area Road Resurfacing to improve access for monitoring and maintenance, new pumps for Pit 6 and Clearwell to improve control of liquid levels in pits, and Pit Area Surface Drainage Improvements.

Additional improvements which have been suggested include the Low-level Waste Processing and Shipping System (an integrated waste processing/handling/packaging system) which will eliminate the need for on-site waste storage, and the eventual stabilization or removal of pit residues which will eliminate any potential environmental impact from on-site stored waste in the future.

3. What is NLO's timetable and plans for dealing with future waste?

RESPONSE:

Current and future waste will be shipped off-site and disposed of at the DOE Low-level Waste Disposal Site located at the Nevada Test Site. Interim processing and packaging of some waste streams with existing facilities will begin in June 1985. New facilities for processing and packaging all waste streams will be available with the completion of the Low-level Waste Processing and Shipping System in FY 1988. This project has been included as a $17 million line item in the FMPC FY 1986 budget. A Waste Incinerator for the burning of low-level radioactively contaminated boxes, pallets, clothing, etc., is proposed as a budget line item for FY 1988.

4. Have injured or ill workers ever been encouraged to report to work (even if for only five minutes) so as to avoid having to report a lost-time accident?

RESPONSE:

Injured or ill employees are encouraged to return to work as quickly as possible consistent with the advice of the treating physician and work restrictions that may be placed on the employee. It is not possible, and never was possible, for NLO to avoid a lost-time injury by having an employee report to work for five minutes. After an injured or ill employee is treated, the Medical Department decides if any work restrictions should be imposed because of the employee's condition. If restrictions are imposed, the employee's supervisor is asked if there are work assignments within the employee's classification that can be given to the employee. If the work restrictions prevent the employee from receiving any assignment, the injury is classified as a lost workday injury.

DOE combines lost workdays and restricted workdays into one category. If an employee cannot perform all duties within his or her classification, the injury is recorded as a lost/restricted workday even though the employee is at work performing the same duties that were being done at the time of injury. Therefore, there is no advantage to NLO with respect to injury records if an employee returns to work early. There could be, however, a monetary advantage to the employee if he or she returned to work promptly.

5. Does NLO's medical department provide followup exams when signs of kidney or lung disease are detected in workers?

RESPONSE:

It is standard practice in the NLO Medical Department for the examining physician to discuss exam results with the employee. If there is evidence of lung or kidney disorders or any other evidence indicating a possible health problem, it is explained and the employee is encouraged to consult a private physician. If requested by the employee, a copy of the NLO medical record is provided for the employee's use.

The practice described in the preceding paragraph applies to possible health problems of a non-occupational origin. If a problem was noted that had an occupational cause (such as acute exposure to acid gas or vapor), arrangements are made for followup treatment at a medical care facility or by a physician specialist.

6. According to prepared testimony, the annual external radiation exposure of workers has been within standards; however, seven apparent skin overexposures involving three personnel were reported in 1984. Please explain the circumstances surrounding these overexposures.

RESPONSE:

There were no actual overexposures. The readings which occurred in 1983 (not 1984) were exaggerated because of problems with a new dosimetry system. The suspected error source was the beta dosimetry algorithm (formula) that is used to convert dosimeter data to radiation dose.

A study performed for NLO by EG&G Idaho determined that the algorithm originally used by NLO in 1983 to calculate skin doses introduced a large amount of imprecision into those dose estimates. Consequently, a new algorithm was adopted based on the EG&G study and work that had been done at DOE's Radiological and Environmental Sciences Laboratory. When 1983 skin doses were recalculated using the original element readings and the new algorithm, there were no quarterly or annual overexposures.

Since 1983 NLO has computed radiation dose from its dosimetry data using the corrected algorithm and is confident that the results reflect actual radiation doses.

7. Beginning in 1956, and running for a few years afterward, reports on estimated stack losses were directed to Dr. J. A. Quigley, M.D. What was Dr. Quigley's role at the FMPC and why were these reports sent to him? Did Mr. Quigley provide any written responses on the subject of stack losses? If so, please provide copies of same.

RESPONSE:

Joseph A. Quigley, M.D., was the Director of the Health and Safety (H&S) Division at the FMPC and received numerous routine reports from Departments in the H&S Division. This is a standard reporting procedure which provides a format for distribution of copies to other divisions in the company. Dr. Quigley did not make written responses to the stack reports.

8. On February 3, 1959, in a memo from J. W. McKelvie to Dr. J. A. Quigley, it is stated that a loss of 240 pounds of uranium resulted because no new bags were available and management decided the collector would operate with the defective bags until new bags became available. Other reports indicate that occasional purchase of inferior quality bags occurred at the FMPC. Reports also show large numbers of bag failures due to inadequate inspection and maintenance. Did NLO believe that no health hazard exists (as a result of these emissions) even though an earlier report suggested this possibility? Is it normal practice for bags which do not fit properly to be placed in the bag house? Is this a quality control problem of the manufacturer or were NLO purchasers at fault? Was there any effort on the part of NLO to seek new kinds of bags which would have been less prone to failure and did NLO experiment with cheaper bags which failed even more easily?

RESPONSE:

The NLO people involved in the early effort to improve dust collector performance wanted to avoid losses due to equipment malfunctions or defects. The discharge of 248 pounds of uranium was not take lightly. Our routine monitoring practices would have disclosed evidence of abnormal exposures. Based on our review of the records it is unlikely that there was any significant health hazard.

It is certainly not normal practice for improperly fitting bags to be placed in the baghouse.

NLO buyers initially purchased filter bags according to specifications and drawings provided them by the original equipment manufacturers (OEM). These specifications and drawings were changed from time to time based on operating personnel's experience with various types and construction of bags.

A great deal of effort was expended by NLO to find bags with better fabric and with better construction than those furnished by the original equipment manufacturers (OEM). It was recognized very early that the OEM bags did not possess the filtration qualities required. The choice of the wool felt bag was the result of this effort. The wool filter bag was more expensive than the OEM bags but it was also superior in filtration capability. Many bags of various types were tested and some failed. Some of the reasons for failure were high temperatures, abrasiveness of uranium compounds, inadequate stitching along the seam or fold, and binding that occurred when the dust accumulation could not be freed during the automatic dust collector cleaning sequence. This effort was an effort to improve filtration, however-- not an effort to find "cheaper bags."

9. Radiation detectors were installed only two years ago in the stack. Before that time there was no way of knowing that a bag house failure had occurred between monthly filtering inspections. Is this one reason why releases were so large?

RESPONSE:

During the period from 1955 to 1983 the monthly inspections of the filters in the "continuous samplers" were not the primary means for detecting whether baghouse filter bag failures had occurred. The primary means of detection was the daily internal visual inspections of the baghouse.

NLO recognized early the need for a device that would sound an alarm when a stack release of radioactive material is occurring. But no such device existed. NLO tested different types of commercial radiation detectors and dust particulate detectors which were specially designed for stack monitoring. But the problem was unique and none of these were satisfactory. NLO then began to work with the idea of adapting a hand-held radiation survey meter to function as a radiation detector in the continuous stack emission sampler. The result of this work was the radiation detector which NLO began to test in the Plant 9 stack two years ago. This was the first application of a standard radiation survey meter to monitor radioactive stack emissions instantaneously.

10. Dust collectors received considerable attention during the early years as efforts were made to meet production requirements while reducing airborne discharges. A sampler was designed for dust collector stacks to monitor discharges. When was this sampler put into operation? Until it was put into position, were all data on discharges only rough estimates?

RESPONSE:

The sampler designed by NLO to collect a continuous sample of the dust collector stack emission was installed on NLO stacks in late 1955. Prior to the installation of this "continuous sampler," the discharge data was based on a statistically sound sampling program involving the use of intermittent samples rather than a continuous sample.

11. On National Public Radio, Mr. Weldon Adams was quoted as saying that the 275 pound emission at the end of 1984 was no cause for worry. (a) What is the threshold above which NLO would say that one ought to be worried? (b) Why did plant management not notify DOE on November 30 when it knew that two large unanticipated releases had been measured? (c) What level of collector losses occasioned reports to the Oak Ridge Operations Office? (d) Were there any loss reports on Plant Nine prior to the September-December releases? (e) What was ORO's response to these reports? (f) Were NLO managers worried about "over-reporting" of unusual events to DOE?

RESPONSE:

NLO has always had an interest in avoiding releases of radioactive materials regardless of the quantity. There never has been a "worry/no-worry" threshold for NLO management even though monitoring and testing which accompanied releases in the past have always indicated that a loss of the quantity of material involved in the November-December 1984 release does not result in significant on-site or off-site exposures. This has been confirmed in the past by the readings from the site boundary station monitors. It has been reconfirmed by the site boundary station monitoring data for the period of the November-December 1984 releases.

Loss size (i.e., loss level) was never a criterion for determining whether or not losses of radioactive materials would be reported to DOE. NLO has always reported all losses of radioactive materials to DOE-ORO regardless of size. Loss size, however, was a criterion for determining whether or not a loss of radioactive material was to be reported to DOE-ORO immediately. Requirements for immediate reporting were always in addition to the requirements for reporting of all losses. The guiding principle for the immediate reporting of radioactive material losses, which was controlling at the time of the November-

December 1984 losses, is contained in ERDA Manual Chapter 0502. Chapter 0502 requires that non-routine losses greater than 5kg which pass the site boundaries be reported to DOE-ORO immediately. Past experience at the FMPC has shown that losses equal to Plant 9 dust collector losses recorded as of November 30, 1984 do not result in 5kg of uranium passing the FMPC site boundary. Therefore, losses of such size were not required to be reported immediately under ERDA Manual Chapter 0502.

At the time of the November-December 1984 dust collector losses, NLO was not controlled by the reporting requirements of the Comprehensive Environmental Response (CERCLA). NLO had been advised by DOE-ORO that the FMPC was specifically exempt from the CERCLA reporting requirements. After the November-December 1984 dust collector losses, however, NLO was instructed by DOE-ORO that radioactive material losses which occur at the FMPC are to be reported as if the FMPC were covered by CERCLA. Accordingly, all non-routine uranium losses to the environment exceeding one pound per day are now reported immediately to the DOE Site Manager.

Prior to the November-December 1984 releases from the Plant 9 dust collector, there had been no loss from Plant 9 which met the ERDA Manual Chapter 0502 criteria for immediate reporting.

NLO management was not concerned about "over reporting" losses of radioactive materials. There was no reason to be concerned: previous reports had never occasioned any adverse reaction from DOE-ORO. NLO's reporting practices were always consistent with DOE-ORO's requirements. There had never been any criticism from DOE-ORO regarding NLO's reporting practices.

12. In a Task Force Report on the review of operations at the FMPC, June 1984, it is stated that improvements will be made in the stack monitoring system to more accurately determine plant emissions. This was three months before the beginning of the releases which included an episode in which the alarm attached to the stack monitor was turned off. What improvements have been made with respect to determining plant emissions since the Task Force Report came out? Can you quantify the inaccuracies of past estimates of emissions?

RESPONSE:

Since the Task Force Report, the following actions have been taken: (1) Steps have been taken (procurement, etc.) to enable "radiation detectors" (i.e., the device that sounds an alarm when a stack release of radioactive material is occurring. See Question/Response No. 9.) to be installed in all dust collector stacks at the FMPC. The "radiation detector" is the improvement that was contemplated at the time of the Task Force Report. Development had begun a year before the Task Force Report. (2) The frequency of baghouse inspections has been increased. (3) The frequency and removal for analysis of the filters in the "continuous samplers" has been increased. (4) Study has begun on replacing the present "continuous samplers" with either multipoint or single point sampling units which sense and automatically compensate for stack velocity changes.

The first three actions are directed at improving the ability to determine instantaneously when a release is taking place so immediate action can be taken to stem the release. The fourth action is directed at improving the accuracy of measurements of emission quantities.

The measurement of emission quantities via the "continuous sampler" (i.e., the method used since 1955) is not significantly inaccurate. The samplers are and always have been isokinetic types which provide a high degree of accuracy at the point of sampling. Any inaccuracy would be related to the position of the sampler intake within the stack. NLO sampler intakes are located at the stack centerline which tends to overstate the actual loss because the stack velocity at the centerline is usually greater than the average velocity.

13. Please explain the statement in the Quarterly Appraisal of NLO's Safety and Environmental Control Program, dated January 19, 1978, under the title of Occupational Health and Safety, which says: "The principal problems encountered during the previous appraisal period were high extremity exposure to personnel." What level of exposures are being referred to?

RESPONSE:

Our records do not contain any explanation of the statement made by DOE in the Quarterly Appraisal dated January 19, 1978. Evidently, the exposures referred to occurred in 1977. For information purposes, we are listing below the ten highest extremity exposures during 1977.

	Annual Dose, Rems	
	Hands	Forearms
1.	64	21
2.	40	13
3.	37	12
4.	37	12
5.	37	12
6.	32	11
7.	30	10
8.	30	10
9.	28	10
10.	27	9
DOE standard for annual dose:	75	25

Because the doses are well below the DOE standard for annual doses, we are unable to explain why DOE thought this was a "problem."

14. Why does rotation of employees at various work stations occur? Is it in order to keep employees exposures within DOE standards? Why did the average person-REM skin exposure for the first five months of 1983 go up 40% over that for 1982 when projected for the entire year?

RESPONSE:

Rotation of employees at various work stations occurs in order to maintain exposures of NLO employees within DOE standards. This is an appropriate safety technique when dealing with radioactive exposures and is an accepted administrative control. Time limits for working inside dust collectors and other enclosures are essentially an application of this same method for controlling exposures. Other methods are used to control exposures including shielding and mechanization of processes where radioactive materials are being handled. NLO has for some time also pursued these other methods. The ideal solution is to remove the radioactive materials, if possible. NLO, in the treatment of its principal radiation problem, namely, beta radiation, has pursued just this solution in two ways. The source of the beta radiation is daughter products of uranium which concentrate on the outer surface of fresh castings. NLO is currently spending $1 million for a facility to remove these products by acid pickling. An even better solution now being pursued by NLO is a method to prevent accumulation of those strong beta emitters on the surfaces. NLO, acting on its own initiative, began a development program to do just this in 1983. This work has shown great promise. A copy of documents describing this work has been made available to Dr. Weiss of Senator Glenn's staff.

The average skin dose did not increase 40% in the first six months of 1983. The actual increase was only 19%. The reasons for this increase are believed to be two in number. First, production increased 26% over the period. Second, a higher percentage of thin flat castings was produced with larger surface to volume ratios. Beta emitters concentrate on ingot surfaces and the larger surfaces contributed to the increase. The "acid pickling" facility discussed above will address these concerns.

15. What kind of filter system was in place at the FMPC between 1956 and 1969 when the huge releases were made?

RESPONSE:

The same kind of filter systems, i.e., baghouse dust collectors, were in place in the 1956 to 1969 period as in later years. In fact, almost all the dust collectors in use now at the FMPC date back to 1956.

16. In an NLO report of February 4, 1957, Mr. R. H. Starkey says that the operation needs a consultant on dust collection matters and also someone who has authority to get things done. He says, "I think he must (should) be a member of the Production Division. I hate to keep harping on the same old thing, but to me 1,450 pounds of uranium is far too much material to be losing out of our dust collector exhaust stacks." A few months later, on May 6, 1957, Mr. Starkey wrote a report in which he says, "All-in-all, it seems that the whole project lagged during April in dust collection inspection and maintenance programs. Every plant lost more material in April than in March, with some losing many times more. It appears as though someone ought to be pushing this aspect of production more strenuously, especially with the recent drive on economy not considering the additional health hazards involved in such high stack losses." I now understand that NLO will shut down any collector whenever there is a problem and that restart will only be authorized by the plant superintendent after appropriate tests confirm that proper repairs have been made and the collector is again operable. When did this new policy go into effect?

RESPONSE:

The Production and the Health and Safety Divisions have always had as their goal the reduction of dust collector losses through improved operating and maintenance procedures and the use of dust collector bags with optimum filtering characterists. These efforts had management support. Annual discharges were reduced by these efforts. When, in December 1984, the DOE Oak Ridge Operations Office took the position that airborne discharges of radioactivity of one pound or more had to be reported under CERCLA, the NLO Manager implemented a policy revision reflecting this changed position which became effective December 18, 1984.

17. In the NLO Health Physics Appraisal Report for 1983, dated December 9, 1983, DOE noted that during a walk-through of Plant Five at least three persons were observed smoking cigarettes or cigars at the work stations where uranium materials are continuously handled. A subsequent survey of an ashtray located in a nearby aisle showed 1,800 alpha DPM. The Report notes that restrictions upon tobacco usage were relaxed a number of years ago. Please explain the hazards of smoking cigarettes or cigars in an environment where uranium is handled and why tobacco restrictions were relaxed. What is the present policy?

RESPONSE:

In a work area, uranium could be transferred to smoking material through contact with soiled hands, gloves or other soiled surfaces. Trace amounts of this uranium could be transferred to the smoker's lips and ingested. The amount ingested would be slight and it would pass through and be discharged from the body.

Tobacco restrictions were relaxed because the amount of uranium that might be ingested during smoking was not considered significant. NLO bioassay monitoring results have supported this position which was consistent at the time with practices at other DOE facilities.

Under the present policy, smoking is not permitted in areas where radioactive materials are handled. Workers must go to approved smoking areas, which are marked by signs, and wash their hands before smoking.

18. How many exposures per month are investigated involving doses exceeding 1,250 millirems per month to the skin or 200 millirems to the whole body? Is it common for these exposures to be adjusted downward because of determinations that the badges worn by workers are contaminated? How are such adjustments made?

RESPONSE:

Over the last nine (9) months, investigations involving doses exceeding 1,250 millirem per month to the skin have averaged four (4) per month. In recent memory, there have been no doses of 200 millirem per month for the whole body.

Most of the investigations do not involve badges which have been contaminated.

After the regular one-month wearing period, the dosimeter is removed from each badge and the badge is checked for contamination with a survey instrument. If the instrument reading exceeds a pre-set acceptable level, the badge is cleaned and rechecked. The initial survey reading is entered into a computer program which calculates an adjusted radiation dose for the wearing period. The computer program is based on data obtained in a study of badge contamination and its effect on dosimetry results.

19. Why were NLO staff slow to identify potentially exposed personnel and evaluate exposures stemming from the September to December 1984 releases?

RESPONSE:

NLO followed its normal monitoring procedures during this period. There was no reason to undertake extraordinary monitoring activities because over 30 years of experience has shown that stack discharges of this type do not result in significant exposures or discernable uranium uptakes by employees. The monitoring that was conducted supports this position.

20. Why was there a 40% increase in worker skin radiation exposure in 1982 over the previous year? Why was there an upward trend in exposures from FY '80 to FY '84? What is the present situation?

RESPONSE:

The elevated doses are believed to result from the sharp increase in production levels in 1982 compared to 1981. Total site production for 1982 was about 64% higher than 1981, while metal casting (where skin dose rates are highest) increased by about 66% in 1982. Since more uranium was being handled, higher doses resulted.

The upward trend in exposures from 1980 to 1984 is a direct result of the increased production during those years. During this period, production levels increased each year without exception, with total production in 1984 being 160% higher than in 1980. Employment was only 78% higher in 1984 than in 1980, so the higher production per employee caused higher average doses as well as higher collective doses.

Based upon the information available at this time on doses received during 1985, the average skin dose for 1985 will be 770 millirems if doses continue at existing rates. This is only about half the 1984 average dose. The reason for this sharp reduction is that the casting operations, where skin dose rates are highest, have been virtually shut down for much of the year.

21. The Task Force Report on review of operations at the FMPC, June 1984, states that new employees receive very little instruction from their supervisors at FMPC prior to being left to perform their job. Does this lack of training apply to all workers that are handling radioactive materials in the plant?

RESPONSE:

Budget limitations of the 1970's forced NLO to disband its formalized training program. At that time, large numbers of employees were being laid off. "New hires" were non-existent. Training was handled capably by the line supervision. A formal training department was not necessary under these circumstances. If training of new employees suffered during the absence of a formalized training program, it was only in isolated instances and did not effect employee performance. Employees continued to receive sufficient instruction to perform their jobs safely and efficiently. Because the circumstances have changed, NLO has reinstated its formal training program.

22. What is NLO's view of the Dames and Moore study to determine the source of off-site contamination in groundwater?

RESPONSE:

The Dames & Moore study has indicated greater hydrogeological complexities than were evidenced in prior studies performed for DOE/NLO. Dames & Moore study stayed within the time and monetary limitations established by their contract. NLO is satisfied with the Dames & Moore work thus far. The study report, which is limited to uranium contamination, is due to be issued in June 1985, and will contain conclusions regarding the source of uranium in off-site well water as well as remedial alternatives.

23. How many permit applications will NLO need at this point to be in compliance with State regulations covering mixed effluents?

RESPONSE:

Effluents from the FMPC do not contain materials which are hazardous as defined by RCRA, 42 USC 6903. Therefore, the effluents are not considered to be mixed, i.e., radioactive and hazardous.

Under the Memorandum of Understanding between DOE and U. S. EPA, an RCRA Part A Permit Application was submitted by Oak Ridge Operations Office at DOE to U. S. EPA region V on July 6, 1984. This application covered five plant areas where EPA-listed hazardous wastes are stored or handled. A RCRA Part B Permit Application will be prepared for submission to U. S. EPA Region V before the due date of November 1, 1985.

There are no airborne mixed effluents. However, Ohio EPA permit applications are being submitted by DOE for potential sources of air pollution.

24. Does the FMPC Emergency Plan include a spill prevention control and counter-measure program?

RESPONSE:

The FMPC Emergency Plan does include a spill prevention control and counter-measure program. The FMPC Spill Prevention Control and Counter-measures (SPCC) Plan is referenced in the Emergency Plan document and exists as a separate document.

25. The Task Force Report says that a major emergency or two minor simultaneous emergencies would really tax the response capabilities, especially on the off-shift, of the FMPC Emergency Preparedness Program. Emergency Response Personnel are expected to perform multiple functions which might conflict. For example, the fire and safety inspector on the off-shift is the plant emergency director, the emergency medical technician and the fire brigade captain. In addition, the security department operates the emergency operation center on a 24-hour day basis with a single security officer. He is responsible for directing the security forces, receiving alarms and dispatching emergency units, making notification and providing meteorological information, calling in additional personnel and coordinating communication. More personnel are clearly needed in these areas. Have you dealt with this situation?

RESPONSE:

The Task Force suggested that NLO consider adding people to the off-shift for the purpose of assisting in emergencies. After careful consideration, we have concluded that such an addition is not warranted for the following reasons:

The Fire and Safety Inspector is trained to handle and control a variety of emergency situations. He will request assistance, as needed, from other on-site personnel. For example, the Utility Engineer is certified in Red Cross first-aid and the Inspector can turn over a first-aid case to the Utility Engineer if a second emergency arises. Although we do not depend on outside assistance as a primary means of control, the Inspector will request emergency squad assistance from a neighboring community to transport an injured employee to a hospital. A squad from a neighboring community may also be called to provide treatment if the Inspector decides such assistance is needed.

It would be unusual to have an emergency which requires more on-duty assistance than is available to the F&S Inspector. It would not be a prudent use of personnel to add another inspector to each off-shift for the purpose of providing back-up when such needs are rare. This conclusion could change if production and maintenance activities increase on the evening or weekend shifts or if the Inspector's duties during the off-shift are expanded to a level which taxes the capabilities of one person.

Although there is only one security officer operating the communications center, there are other on-duty security personnel who are trained to assist in those few cases when help is needed. On the day shift, Monday through Friday, there are three Security Department supervisors available plus a sergeant who is the field supervisor. In addition, six security officers are on-duty and could provide needed assistance. On the off-shifts, five security officers are on duty in addition to the field supervisor and the communications officer. We have concluded that there is no justification at this time for adding a second person to assist in the communications center.

26. You say that effective in mid March 1985 residues in Waste Pit Four have been limited to graphite, construction rubble, and asbestos. What is the source of the asbestos placed in Pit Four?

RESPONSE:

The radioactively contaminated asbestos buried in the pit comes primarily from pipe insulation which was installed years ago. This insulation is removed either because it is deteriorated or because the associated piping is being replaced.

27. What liquid wastes were placed in Pit Five prior to December 12, 1983?

RESPONSE:

The liquid wastes placed in Pit 5 were primarily raffinates from the NLO uranium refinery. Uranium-bearing solutions containing impurities are purified in the refinery extraction process. After they are extracted, these impurities are called "raffinates." Because the raffinates also contained nitric acid, they were neutralized with lime before being discharged to Pit 5. In fact, lime is probably the largest constituent of the Pit 5 contents. The other impurities vary widely depending on the source of the refinery feeds but they are mostly metals, silicates, carbonates, and nitrates.

28. The Ohio Air Pollution Control Code requires that malfunctions of air pollution control equipment which results in the violation of emissions standards are to be reported to the Ohio Environmental Protection Agency. NLO environmental oversight procedures do not provide for recognition and compliance with this regulatory requirement. Do you intend to change this situation? Why was it that you were not reporting to Ohio EPA?

RESPONSE:

In the past, DOE required that NLO make such reports to Oak Ridge DOE and that DOE/OR make all required reports to regulatory agencies. At the request of the Ohio EPA, NLO will also notify the Southwestern Ohio Air Pollution Control Agency (OEPA) after a malfunction of air pollution control equipment which results in emissions above permitted standards.

29. In its Annual Environmental Management Appraisal of the Feed Materials Production Center, dated September 5, 1978, DOE reported on NLO's compliance with official DOE imposed environmental protection requirements. The Report stated: "The increase in the discharge of radium from the thorium packaging operations has caused the levels of radium-228 to exceed the unofficial DOE wide goal of meeting the off-site concentration guide levels in the plant effluents themselves. Since May 1977, levels have been observed as high as ten times the OSCG levels in the plant effluent. The increased levels in the discharge have been a source of concern to both ORO and NLO personnel." Can you explain what the problem was in this case and what has been done about it?

RESPONSE:

NLO never had a problem meeting DOE's official off-site concentration guide (OSCG) level for Radium-228 (R^{228}) in uncontrolled area waters (i.e., the Great Miami River). When natural thorium, the source of R^{228}, was processed at the FMPC, the average concentration of R^{228} in the uncontrolled area waters was less than 0.01% of the official OSCG level.

The Appraisal dated September 5, 1978 discussed R^{228} in the FMPC effluent in the context of an unofficial DOE goal. That unofficial goal was to have effluent (i.e., the water discharged from the FMPC) meet the same rigid criteria for radionuclide concentrations as were applied to waters in uncontrolled areas (i.e., the Great Miami River into which the effluent was discharged).

Although the average R^{228} concentrations measured in the uncontrolled area water never exceeded the official OSCG level, the R^{228} concentration in the FMPC effluent did not drop below the official OSCG level until NLO added a special treatment process to the effluent. Barium carbonate and aluminum sulfate were added to remove the R^{228}. With the addition of the treatment process, DOE's unofficial goal was attained.

Today, no thorium is processed at the FMPC.

30. In the Annual Environmental Management Appraisal of 1980, it is stated that "limited soil sampling off-site, but near the plant boundary, has indicated uranium contamination above background, especially adjacent to and downwind from the old incinerator. Home gardens and commercial farming are prevalent in the surrounding area as well as dairy cattle grazing. It is recommended that off-site soil sampling be expanded to evaluate the extent and significance of any radioactive contamination due to plant operations." What results have been found as a result of such sampling in residential vegetable gardens and commercial farms?

RESPONSE:

During the summer and early fall of 1984 over 100 soil samples were systematically collected from areas adjacent to the FMPC. This expanded off-site soil sampling shows that 98% of the results are less than 35 pCi/g, a concentration used as a guideline in the uranium tailings projects. Most results were less than 5 pCi/g, with background in this area being about 3 to 5 pCi/g.

The sampling confirmed that higher than background radiation levels exist in the area downwind of the old incinerator. In that small area within 200 yards of the eastern site boundary, only two samples exceeded the aforementioned mill tailings guideline.

Comparative analyses of vegetable and milk samples from the area immediately surrounding the FMPC and from distant areas have demonstrated no statistical difference.

31. In NLO's prepared testimony, mention is made about the level of uranium in three off-site wells. Why did NLO and DOE wait until 1981 to test three off-site wells for uranium? What prompted the tests? Did you know or suspect that off-site wells were contaminated prior to 1981? What was the level of uranium in each well?

RESPONSE:

We did not sample offsite wells and analyze for uranium because our onsite test wells did not indicate that there was a significant uranium migration.

The NLO tests for uranium in offsite wellwater were prompted by a request for assistance from the Ohio EPA in late 1981. OEPA had found beta activity in water from a Fernald well and in water from a well on Willey Road, adjacent to the FMPC southern boundary. NLO determined the activity in the Fernald well was due to potassium-40. Activity in the Willey Road well was due to uranium daughters; NLO also determined uranium was present at a concentration above the normal background. These results were reported immediately to the OEPA. Later, the Ohio Department of Health became the lead agency and all results were reported by NLO to the ODH Director of Radiological Health.

NLO and DOE did not know or suspect that elevated uranium concentrations were present in offsite wells until these first analyses were made in late 1981.

Above-background concentrations of uranium have been found in three wells south of the FMPC. Initial sampling dates and results are given below:

Well Location	Date Sampled	Uranium mg/l
Knollman property	11/24/81	0.19
Delta Steel	12/8/81	0.32
Mobil Chemical	12/8/81	0.054

32. With reference to NLO's position regarding the 1983 Doctoral Thesis (which concluded that an increased incidence of non-malignant lung disease exists among NLO workers because of uranium exposure) you concur with an NIH report which says the thesis is flawed and the conclusions unwarranted. Do you mean that there is no increased incidence of lung disease in workers at the FMPC? Or, are you saying there is an increased incidence, but it is not due to uranium exposure?

RESPONSE:

On the basis of the author's personal comments and the evaluation by recognized experts, NLO concluded that the dissertation by Jerome Wilson, Ph.D., does not support a finding of increased lung disease at the FMPC, regardless of cause. A critique by Dr. C. Ralph Buncher, Director, Division of Epidemiology and Biostatistics, College of Medicine, University of Cincinnati, conlcudes that Dr. Wilson's treatment of all respiratory diseases as one entity is misleading and is like "combining apples and oranges and bananas." Dr. C. C. Lushbaugh, Chairman, Medical and Health Services Division, Oak Ridge Associated Universities (ORAU), notes that Dr. Wilson's observations are the results of early analyses of ORAU data which are considered preliminary since they emerge from a changing data base that is known to be incomplete and is still being edited, corrected, and validated. He explained that the dissertation, which was written while Dr. Wilson was a student at the University of North Carolina, merely explored the feasibility of using insurance records to measure respiratory illness and was not intended to prove or disprove a higher incidence of non-malignant lung disease, regardless of the cause. Dr. Millicent Higgins, Associate Director for Epidemiology and Biometry, National Institute of Health (NIH), also has raised serious questions regarding the adequacy of the underlying data. Dr. Higgins also observes that the study was designed to evaluate the usefulness of health insurance claims in a study and to generate hypotheses, adding that further investigation is needed. Additionally, on numerous occasions Dr. Wilson has stated that his dissertation had been misinterpreted and that it tested a study method and was never intended as a definitive study of disease incidence.

33. What are the NLO injury rates in comparison with other industries in the National Safety Council Program classification? What does the DOE Task Force Report say in regard to the high accident rate at the FMPC?

RESPONSE:

During the five-year period from 1979 through 1983, the rate of NLO Lost Workday Cases per 200,000 manhours worked has been far better than the rates for "like industries" and for "all industries." Listed below are the NLO rates compared with other rates published by the National Safety Council:

Calendar Year	NLO	Like Industries	All Industries
1979	0.0	3.18	2.7
1980	0.5	1.89	2.8
1981	0.2	1.28	2.2
1982	0.3	1.18	2.1
1983	0.3	1.54	2.2
1984	0.4	Not available	

The DOE Task Force draft report includes a passing reference to high NLO accident rates during 1983. However, in 1983 NLO was at the DOE average rate for cases involving days away from work plus restricted work days. During the period 1980 through 1984, the average NLO rate was 10% lower than the average DOE rate for the same period.

Calendar Year	NLO	DOE Average	Difference
1980	0.79	1.1	NLO 28% lower
1981	0.9	1.0	NLO 10% lower
1982	1.2	1.0	NLO 20% higher
1983	1.1	1.1	Same
1984	0.7	1.0	NLO 30% lower
5 year average	0.94	1.04	NLO 10% lower

34. The semi-annual appraisal of NLO's Safety and Environmental Control Program dated October 20, 1981. stated that "a significant effort should be made in the area of health protection before the program will fully meet the performance objectives." What was the overall rating for the year of 1981 and did you receive an award fee?

RESPONSE:

The rating for both FY 1981 periods was "Excellent" for Safety and Environmental Control as well as for overall NLO performance. The earned award fee was paid in accord with contract provisions.

35. Why did it take so long for NLO to understand that DOE/OR requires NLO management to report all events having environmental protection, safety, or health protection significance as unusual occurrences?

RESPONSE:

It was only after December 1984 that DOE/OR informed NLO that NLO management was to report "all events having environmental protection, safety, or health protection significance as unusual occurrences." Before then, NLO took its guidance on the meaning of "unusual occurrence" from the DOE Orders which were then in effect. This guidance was reinforced by the reporting traditions and practices that had been established between DOE and NLO over the years. Before December 1984, such a release would not have been an "unusual occurence" as used in DOE Order 5484.1. DOE Order 5484.1 and its successor DOE Order 5000.3 which were in effect in December 1984 define an "unusual occurrence" as "(A)ny unusual or unplanned event having programmatic significance such that it adversely affects or potentially affects the performance, reliability or safety of a facility." The December 1984 dust release did not fit the definition.

The DOE specifically describes the types of releases for which it requires immediate notification in DOE Order 5484.1. They are:

1) Any release of radioactive material to controlled or in controlled areas in concentrations which, if averaged over a period of 24 hours, would exceed 5,000 times the respective concentration guides specified for such materials in DOE Order 5480.1. Chapter XI, "Standards for Radiation Protection,"

2) Any release of radioactive material off-site that could reasonably be expected to result in an annual dose or dose commitment to any member of the general population greater than the annual standard set forth in DOE Order 5480.1, Chapter XI, "Standards for Radiation Protection."

DOE Order 5484.1 provides also for "notification to ORO of occurrences which would give rise to inquiry by members of the press or public or where a press release is made." Based on past experience, NLO did not consider the December 1984 dust release to be an "unusual occurrence."

36. NLO's response and its action plan to DOE's Task Force recommendation that more health and safety staff be hired was to say that the Health and Safety Division had doubled in size between January 1, 1979 and January 1, 1985, from 21 to 40 people, and that four more would be added. Since the entire plant force has doubled over this period and production output has gone up nearly 300%, is four additional employees enough to carry out a mission that has been woefully neglected in the past?

RESPONSE:

It is misleading to infer that NLO responded by saying that only four people would be added to the Health and Safety Division to cope with a doubled plant force and an increased production level. The reply to the Task Force report says the H&S Division had increased from 21 to 40 people and four more might be added which would mean an addition of 23 people for an increase of 110%. NLO believes its staffing plans for the Health and Safety Division are appropriate under the circumstances.

We reject and object to the unsupported statement of woefully neglected mission and we note the high ratings which NLO received from DOE for Health and Safety performance.

37. What are the standards NLO utilizes when reporting the loss or release of uranium? Please explain the discrepancy between Mr. Spenceley's statement in the Investigation Report where he says that a loss of 63 kilograms of uranium was too little to report, while Weldon Adams, on Page A3 of the Investigation Report, says that 11 pounds, or about five kilograms was the threshold for reporting. Which gentleman is correct?

RESPONSE:

NLO now reports the loss of uranium in quantities of one pound or greater because in December 1984 DOE instructed NLO to report as though CERCLA applies to the FMPC.

There is a difference between the statements of Messrs. Adams and Spenceley, but no discrepancy. The difference between statements is due to the fact that Mr. Adams was referring to the loss of material offsite. The last published document received by NLO from DOE and concerning the release of radioactive materials was from the predecessor agency ERDA and was ERDA Order Manual Chapter 0502. This document specified that any release of 5.0 kilograms (approximately 11.0 pounds) or greater of radioactive material offsite must be reported. Mr. Adams' statement was in reference to this document and indicated his understanding that losses of 5.0 kgs of material offsite must be reported.

Mr. Spenceley had the same understanding and referred to the same Order in determining what quantity of loss was reportable. His statement reflected NLO's experience that while a loss of 63 kgs of uranium occurred on-site, little of it, and certainly less than 5 kgs of it, actually left the site. Therefore, in accordance with the provisions of ERDA Manual Chapter 0502, the loss was not reportable.

38. The Incident Investigation Report on page 27 says that NLO upper management was holding meetings to discuss plant highlights. A listing of the highlights was typed and ready for a meeting held at 11:00 a.m. each day. During the September-December 7, 1984 time frame there were a number of entries concerning the Plant 9 Collector, including an entry on November 12, that the N-reactor furnaces have lost seven shifts while maintenance is repairing the dust collectors. Then on November 13, it was reported that the American Dust Collector was repaired at the end of the first shift the day before. Then there were other references to dust collectors on November 27 and December 7. Do these references mean that NLO upper management knew about the losses as they were occurring?

RESPONSE:

NLO top management was not aware of the losses in the collector as they were occurring. The entries listed are correct. There was an entry on November 12 indicating production downtime because of repairs to the dust collector, but there was no mention then or later of any loss of material from the collectors. It is not unusual for a dust collector to require repair or maintenance. And just because a dust collector needs repair does not mean there has been a loss of material.

Senator **Cochran**. We will call our next panel, which will include representatives of the Fernald Residents for Environmental Safety and Health, and the trade and labor unions.

Specifically, we have scheduled to testify before the hearing, Ms. Kathy Meyer, who is chairperson of Fernald Residents for Environmental Safety and Health; and Mr. Gene Branham, president of the Fernald Atomic Trade and Labor Council, if you could please come foward.

I know that you have probably heard my request, which I made earlier, for keeping the oral presentation to the committee to a time period of 10 minutes or less. We would appreciate it very much if you could help us in that way to give us an opportunity for questions and discussion of the issues you raise in your testimony to the committee.

We appreciate very much your being here today to help us in our effort to explore the facts and circumstances surrounding the safety and management of this energy production facility.

Ms. Meyer, we would ask you to please proceed. We have a written statement, I think, which we will make a part of the record in full. You may proceed.

TESTIMONY OF KATHLEEN M. MEYER, CHAIRPERSON, FERNALD RESIDENTS FOR ENVIRONMENTAL SAFETY AND HEALTH [FRESH], ACCOMPANIED BY LISA CRAWFORD, MEMBER OF FRESH, AND DON MEYER, MEMBER, SOUTHWEST SCHOOL BOARD; AND GENE BRANHAM, PRESIDENT, FERNALD ATOMIC TRADES & LABOR COUNCIL, ACCOMPANIED BY GEOFFREY SEA, CONSULTANT, DAVID ORTLIEB, CCW CHEMICAL WORKERS, AND ROBERT SCHWAB, PRESIDENT AND CHAIRMAN OF THE SAFETY COMMITTEE, REPRESENTING THE UNION AT NATIONAL LEAD

Ms. **Meyer**. Thank you, Mr. Chairman.

As a point of introduction, I would like to introduce two other additional members of the FRESH community that are with me today. To my far right is Ms. Lisa Crawford. Besides being a member of the FRESH community, it was on her property the well was found to be contaminated, and she was drinking water for 5 years without being aware of that.

In addition, next to me is Don Meyer, an attorney, and also a member of the Southwest School Board.

Senator Glenn, Senator Cochran, Congressman Luken members of the staff, ladies and gentlemen, I am here on behalf of many who live in the area surrounding the Department of Energy Fernald Plant, who share my concern for our health and that of our children.

I have two children, ages 6 and 7, who attend Crosby Elementary School located just 1 mile from the plant site. I mention this specifically because it was at their school just last December that I and my neighbors were first informed by DOE that uranium dust had leaked into the air going undetected from September to December.

More disturbing, we were made aware that similar and more serious leaks had occurred over the last 30 years and the water in our area was contaminated with uranium. At this time, they would only say to the hundreds of people at the meeting, quote, "We've known about this for 5 years. We're studying the problem and hope to know its source next spring"—6 years after first discovering the contamination. They would not tell us where the contamination was or even its general area.

Can you imagine our concerns as we sat there and listened to this? We were seated in a grade school auditorium—250 students attend that school every day—and DOE would not answer us as to whether our children's health was in jeopardy, or, for that matter, our own health or that of our neighbors.

We were soon to find out, not through DOE, that our neighbors were, indeed, drinking water contaminated by uranium over the 5-year period without being aware of the risk involved.

Since that first meeting last December, much information has come to our attention which only increases our concern.

There has been over 200,000 pounds of uranium dust leaked into the air since the plant opened 30 years ago. After every release that was ever made public, the press announcement always stated, "There is no harmful effects as a result of this release." You can cry wolf only so often before people do not believe you. Another answer frequently used was that the leaks remained on plant site.

We are aware, as is everyone, that dust particles released into the atmosphere did not automatically stop at a fence line. Their credibility has been totally destroyed. 200,000 pounds of radioactive material was released; not 1 or 2 pounds, but 200,000 pounds, and many people surrounding the Fernald community have lived on their property since before the plant even opened.

I am sure you are aware that the parent company plant similar to this one that is located in New York has had to have topsoil removed from their homes surrounding the plant site. To date, no soil test has even been done.

It is readily apparent as to how these persistent leaks have occurred at the Feed Materials Production Center. The only regulatory control of these emissions up to the present has been exercised by the DOE—the producer regulating itself. Reportedly, it has been regulating its facilities by requiring them to control their uranium emissions to as low as reasonably achievable, ALARA, but the record at the Feed Materials Production Center is reprehensible.

In its recent report on its investigation of the September to December 1984 leaks from plant 9, it admits that one of the causes of the massive leaks was the lack of an effective ALARA program. Why did it take DOE so long to find this out? It is eminently clear to us that this type of admission is indicative of the need to replace DOE as the regulator.

DOE also admits in this same report that, "uranium control, monitory equipment and practices have, in general, failed to keep pace with the best available technology." Whose plant is this anyhow? Doesn't the owner have a responsibility to equip its plant with the mechanisms necessary to protect its neighbors from emissions that endanger their health? Private industry must do so. Why not DOE?

The October 1984 report prepared for the U.S. EPA by the Pacific Northwest Laboratory operated for DOE by the Battelle Memorial Institute concludes that by installing improved emission control technology, the 1981 pulmonary dose rates from Feed Materials plant could be reduced by 75 percent. This technology includes new high efficiency particulate air [HEPA] filter systems. Despite DOE's awareness of these technological improvements, we have as yet received no commitment whatsoever from its officials as to when or even if any of these improvements will be made.

Frankly, we need to know above all else what the effects of these emissions into our air, our water, and soil have had and will have on our health. Nothing that has been done so far has answered this concern at all. The Department of Energy did, for a brief period, provide a "whole body counter," and they referred to that in their testimony. Many of our neighbors participated in this test, but the only results we received was a phone call from DOE personnel that by their standards we were OK.

To the best of my knowledge, none of us have received a written report of these findings, which then could be reviewed by an independent source.

Emotional trauma, fear, uncertainty, continue to plague our community, particularly when we read the conclusion of the EPA that, "there is no scientific doubt that radionuclides are carcinogens."

The crux of the problem continues to be that the Department of Energy, while producing the materials that endanger our health, sets its own standards for safe levels of air, water, and soil contamination, and monitors its own performance. Unless this situation changes, we can never feel safe.

With this in mind, we strongly urge that Congress take the following steps:

One, place the responsibility for determining what constitutes unsafe levels of radioactive emissions in our water, air, and soil in the hands of the Department of Health and Human Services, free from the interference from DOE. Furthermore, authorize the Department of Health and Human Services to do the testing for radiation detection and measure the results against the standards, which it has set, not DOE.

Two, modify the Resource Conservation and Recovery Act to permit the EPA to monitor the treatment storage and disposal of mixtures of hazardous and radioactive waste, so that the legal uncertainty of regulatory authority is permanently resolved against the DOE. Also, we would request the EPA to provide us with an annual environment monitoring report of DOE facilities, such as Feed Materials so that we have an annual independent assessment of our air, water, and soil quality.

Three, we support Senator Glenn's proposal to place air monitors in all directions of the Feed Materials plant. We would urge that the EPA conduct periodic examinations of these stations, at least quarterly, and that the results be published with its other findings in the annual environmental monitoring report, which I have previously suggested.

Four, appropriate the funds necessary for the DOE to install the technological improvements needed to substantially reduce the levels of radionuclides into our air and water, and to clean up the damage it has already caused to the ground water, surface water, and the soil in the areas surrounding the plant.

I have a few additional comments after hearing testimonies today.

DOE and NLO stated in their testimony that they want to be, "a good neighbor". A good neighbor does not take 30 years to meet its neighbors, nor 30 years and outside pressure to become concerned for their health and safety.

I want you to know that we in the community are going to keep focusing on these issues and pressuring to get the answers we want because it's our health and that of our children that will drive us. We will not stop until we are safe.

I sit here before you pregnant with my third child, and I wonder daily if that child is already damaged physically just by breathing the air and living in the home that I do.

I reiterate again. We will not stop until we in the community are safe.

Thank you.

Senator **Cochran**. Thank you, Ms. Meyer, for your testimony.

Mr. Branham, you may begin.

Mr. **Branham**. Thank you, Mr. Chairman.

First, I would like to introduce the other members of the delegation that represent labor. To my left is Mr. Geoffrey Sea, health and safety expert, consultant to the council. To his left is another health and safety expert representing the International Chemical Workers Union, ICWU, Mr. David Ortlieb. To his immediate left is Mr. Robert Schwab, president and chairman of the safety committee, representing the union at National Lead. His committee consists of 24 members and himself onsite interior monitoring.

I'm Gene Branham, as I just said. I'm president of the Fernald Atomic Trades & Labor Council. I've been a 32-year-plus employee at National Lead.

This council represents 15 international unions. All production, all maintenance workers, all service workers, total approximately 627, to date, employees.

Our testimony will be less formal and more practical. It will be followed up with documentation that will be in your possession within 10 days of when this hearing concludes.

We would like to address in response to a letter we received to four areas that we feel is most needed.

First, we would like to give a general overview from labor's perspective.

In the 33½ years history of management incompetency and collusion with DOE and NLO to cover up the life-threatening effects of that incompetency.

Today I will present an outline of the problems as we see it, as labor sees the problems. To do full justice to this, it would take a matter of days, if not years, so we will submit a general outline, as comparison to an in-depth, detailed verbal transaction at this time.

I would like to cover the full scope of concerns of the workers at the Fernald project first. We fear for the unmonitoring—the largely unmonitored exposures that we have had and we continue to receive daily. These exposures to the radioactive compounds includes compounds of uranium, plutonium, radium, technetium, and thorium, and nonradioactive chemicals including asbestos, TCE, PCB's, numerous acids, numerous fluorides, solvents, and heavy metals.

Third, we fear for the cancers and the leukemias known to be associated with these exposures, which are now only starting to appear due to the latency periods since the plant operation began.

We fear for the chronic lung and kidney diseases that are now appearing from years of exposure to dust and fumes.

Five, we fear for the genetic health of our children, as Ms. Meyer referred to in her testimony.

We should point out that a fairly large number of employees, approximately 42 percent, under the age of 25 years of age; therefore, their families are either in the process or yet to be developed. There could be far-reaching genetic effects that should be taken into consideration. These are young men.

We fear for the health and the vitality of the surrounding communities, even the metropolitan areas.

I would like to go a little further and point out as the council perceives the failures of management; specifically, NLO management.

Management has consistently over the past years, by way of demonstration, put the emphasis on production over safety. At no time has safety priorities exceeded that of production commitments. This situation still exists today, regardless of what previos testimony has been presented.

Second, ignorance of the complex technology that's being entrusted to management.

Third, total arrogance, total lack of concern for the workers and their well-being.

Fourth, incompetence. This is due to a distorted promotion policy. By way of example, I will point out one of the more obvious ones. Procurement division consists of four departments. From the director of that department to the most recently hired clerk, not one member has ever performed 1 hour's work from labor. They've all been former clerks, with all respect. They have no experience, no knowledge, no ability whatsoever. They have never operated as much as a Singer sewing machine, but they will tell you how to operate a 135-foot crane.

Fifth, dishonesty and a tendency to hide behind national security in order to cover up errors, known errors.

I would like now to direct our testimony to the Department of Energy. As Mr. La Grone pointed out, for the last 12 years the Department of Energy has not had an onsite overseers, since 1973. That correction was made a couple of months ago in the person of Mr. Reafsnyder.

Since there has been no one onsite, since they are located approximately 5 hours by drive, it's obvious that the location and in person, that itself indicates the lack of oversight that's been exercised.

Despite the many faults that we pointed out of National Lead, we feel the primary responsibility can be laid at the door of the Department of Energy. The Department of Energy owns the plant. It owns the material. DOE has been the one that has allowed the plant to become rundown, dilapidated, deteriorated to the extent that it has subjected us all to scrutiny and to job insecurity, and many, many other things.

It's the Department of Energy that has monopolized the regulation of the facility and so has prevented any true oversight over the years. It is the Department of Energy that has erected the wall of national security for management to hide behind.

It is the Department of Energy that has consistently implemented policies that benefits its contractors while endangering the community and the lives of its workers.

Specifically, the Department of Energy has engineered a contracting system that eliminates legal liability for negligent actions. In doing this, safety inspections and appraisal reports have become a practical joke; a system of reporting and recordkeeping seemingly designed to hide evidence of wrongdoing and prevent mistakes from being caught; a system for public relations designed to keep workers and the public either uninformed or misinformed; guidelines for monitoring and medical followup designed to increase the occurrence of disease and prevent its detection, specifically, the detection to workers.

There are corrective actions that the council feels needs to be addressed and called to this committee's attention.

First, we see the Glenn-Wirth bill as an important first step in stripping DOE of its monopoly over radiation in health effects research.

Second, we think the bill should be broadened to include areas of research other than epidemiology. These should include environmental research, health registries, human clinical research, animal studies, and so on.

Third, we propose that the Atomic Energy Act be amended so as to eliminate the exemption of atomic workers from OSHA jurisdictions. That's extremely important when you evaluate it. Labor has restrictions that are abnormal in comparison to other industries. There is not other like it.

We call for the immediate placement of worker representation on all DOE research, advisory, and investigative boards.

We call for a comprehensive investigation of the DOE contract and administrative system with an eye toward concrete recomendations for changing the system.

Specifically, we recommend that the following costs of operations become a nonreimbursable items by DOE: first, grievance arbitration costs; second, workers compensation costs; third, legal defense costs; fourth, fines and penalties levied; fifth, public relations costs; sixth, labor relations costs during strikes, seventh, the costs of corrective actions, such as cleanup of illegal dumps and waste sites.

The council feels, as taxpayers, that we should not be responsible for paying for the improper and negligent actions of Government contractors.

We call for a comprehensive review of national security restrictions as they relate to the revelation of health, safety, and environmental problems at Federal facilities. We feel an immediate need for clarification of the security restraints on DOE contractor employees in language that ordinary workers can understand.

A word of clarification: In the early part of this investigation, there was a delay because employees did not fully understand the security rules, and, therefore, were afraid of having security violations imposed on them for responding to agency's inquiries. We finally received that immunity guarantee which allowed us to participate.

Until such time as regulatory authority can be transferred from the Department of Energy, we ask for immediate changes in the Department of Energy's health and environmental control program. The ATLC offers the following suggestions to accomplish this: First, a system of fines and penalties for the contractor violations; second, a system of followup on appraisal recomendations; third, regulations covering toxic chemical exposure; fourth, a urine uranium standard; fifth, a 10-fold reduction in radiation exposure standards; sixth, a recordkeeping system for chemical exposures, and for data obtained from urinalysis and whole body counting; seventh, a comprehensive radiation exposure registry.

We have many specific recommendations for improving conditions at the Fernald site. We have made many of these recommendations to the company at company and union safety meetings, but we have been ignored. Other recommendations are contained in a comprehensive bargaining package. They, too, have been ignored. We have asked NLO to reopen the health and safety section of our contract immediately so that we may negotiate over these items, and NLO has refused to do so.

We ask for direct congressional intervention over the next year to oversee the transition of a new contractor and to maintain the integrity of the plant's records. Senator Glenn addressed this earlier. We are in complete and total agreement.

We endorse the five initiatives of Senator Glenn and his proposals. We would like to thank Senator Glenn for showing rare political leadership in protecting the lives and health of the working people.

Finally, we ask specifically that a representative of Senator Glenn's office—and this is most important, so I'll call your attention to it personally—the Atomic Trades & Labor Council asks specifically that a representative from Senator Glenn's office meet us on the plant site, so that we may transfer important documentation, documentary evidence, of safety violations. We require this arrangement because it would be a violation of company rules for the union to remove any documents from that site.

In previous testimony, there has been issues brought up that we believe are repetitious and time-consuming if we were to address them, so on that matter, we will refrain from addressing all of them. Although, if the chairman will bear with me since they had 40 minutes and we've had only 10, we would like to call your attention to a couple of quotes that we feel are not only misleading, but completely out of context.

The director of health and safety for National Lead has made the statement, "You have to eat a teaspoonful of uranium a day for it to hurt you."

Senator Cochran. What? I couldn't understand you.

Mr. Branham. It is pretty shocking. The director of the health and safety department for National Lead has made the statement, "You have to eat a teaspoonful of uranium a day for it to hurt you." Now, mind you, this came from the director of the health and safety department for National Lead, and I have sat across the table a lot of years from the assistant plant manager, another quote, "The most dangerous thing you could do with our uranium is to drop it on someone's head."

Now, these are two statements that are made by responsible people, well educated, with over 30 years of service at National Lead, trusted by the Department of Energy, charged with oversight and welfare of the workers, of the community, the outlying areas, the emissions, what have you. We feel that this should indicate to the committee by way of example, not only in errors, but ignorance and lack of concern to the welfare of the workers and the protection of a community such as this.

We would also like to respond to one statement given prior to our appearance by a national labor representative pertaining to the present union leadership. The insinuation was that they did not represent the people in majority. In fact, all issues are put before a board of delegates. Every issue that has gone before this board since December 1984 has been passed unanimously. I've been a member of this union for over 32 years, and I've never seen one issue until this time that didn't pass unanimously. So, that should indicate that it is the consolidated efforts of all 15 internationals together.

I would like to conclude my testimony at this time. The Fernald Atomic Trades & Labor Council would like to thank you, Mr. Cochran, chairman; Mr. Glenn, Senator; Congressman Luken for extending labor this rare opportunity to be heard. I personally appreciate it. Thank you, gentlemen.

Senator COCHRAN. Thank you, Mr. Branham, for being here and for testifying at our hearing.

Ms. Meyer, I heard your statements concerning the screening that was done by the Department of Energy to try to determine if there had been any adverse health consequences as a result of any emissions of uranium particles from this facility. And you said you had not gotten any written results from those tests. Have there been any efforts made by any individuals in your group or your group as an organization to get a screening done by any other physicians, or by independent sources, or entities other than screening done by DOE?

Ms. MEYER. Yes, individual members have pursued that one their own and sought outside sources to get independent results.

Senator COCHRAN. I don't want to get into the specifics of anybody's health, but has the organization come up with any results that would indicate that there have been adverse health consequences suffered by any citizens of the community as a result of emissions from this facility?

Ms. MEYER. At this time, I could not state specifically that there has been. There has been so much confusion with varying what-are-safe levels, and what is safe, and who to go to, and people, even respected physicians' opinions varying of their viewpoint on radioactivity from one spectrum to the other; that it will completely kill you or you might as well—or it will increase your lifespan. So, we have heard all kinds of reports that answers questions specifically, and we don't have any concrete evidence that I could give you, that I am aware of.

Senator COCHRAN. Right. Mr. Branham, I understand that you have worker health and safety concerns there in the plant because of the disclosure of emissions of particulate matter out of the stacks. Has there been any screening undertaken at the behest of the union, or any workers groups, or individual workers, to your knowledge, that have resulted in any disclosures of sickness, or health, or any damage to individuals as the result of these emissions?

Mr. BRANHAM. I will ask Mr. Sea to respond to that, if you don't mind.

Senator COCHRAN. Could you identify yourself for the record, please, so we will have your name?

Mr. SEA. Yes, my name is Geoffrey Sea. I'm a consultant to the Fernald Atomic Trades & Labor Council.

First, I would like to make a general statement, and that is that the council is not interested in counting dead bodies. We're interested in preventing death and illness.

The kind of illnesses we're worried about are those that are long-term illnesses that occur with long latency periods, anywhere from five to sometimes 30 years after exposure.

And, so, while I will talk about some of the evidence we have of problems, I also want to point out that we're seeing now only the tip of the iceberg of diseases and deaths that occurred from the earliest years of plant operation, and we would like to urge that people adopt the preventive attitude in terms of this question, and to look more at the exposures than at the actual occurrences.

Now, in terms of respiratory disease, we know that we do have a preliminary study done, commissioned by the Department of Energy, that shows a very high rate of mortality from long-term respiratory disease from exposure to uranium dust.

Senator COCHRAN. Has the union undertaken any screening of workers, and, if so, what is the result of them? That is my question.

Mr. SEA. The union has conducted an informal attempt to try to locate cases of cocupationally caused illness, and we do have a number of cases that are at various stages, either in the workers' compensation system or in the legal actions.

Senator COCHRAN. How many workers are we talking about here that have been identified by that screening process?

Mr. SEA. Well, again, I would like to point out, it's been informal. Our efforts have been directed at calling in NIOSH and other Federal agencies to conduct proper scientific screenings. And so our own efforts have only been oriented towards picking out individual cases where we felt that it would—so, we have not done any general surveys of the work force. We want NIOSH to do that. You know, I could give you a number of specific individual cases we have found.

Senator COCHRAN. I'm just interested in the response to the question. I'm not suggesting that you shouldn't, but I'm just curious as to whether you have or not, and if there was any result that you could tell us.

Mr. BRANHAM. We neither have the resources, nor the ability at this time. We have just done informal inquiries.

Senator COCHRAN. Senator Glenn.

Senator GLENN. Yes. Thank you, Mr. Chairman.

The one thing that I would like to ask or I would like to make a statement to those who are still in the room here, and that is one of the things that concerned me is that this so-called ALARA Program. It seems to either not have been really operative or is really not being pushed by DOE or the contractor. The ALARA Program, means as low as reasonably achievable. And whatever these releases are in the plant, and whatever the situation is out there, it shouldn't be just some arbitrary standard, because those change.

You know, back in the time when the first nuclear weapon was ever set off out in the desert at Alamogorda, we didn't know that much about what was going to happen, and so they set some arbitrary limits and thought this was going to be safe. We now know that some of those limits were not safe, and had they gone as low as reasonably achievable, and used that as a standard all the way through, as we learn more, we should be pushing not to just set an arbitrary standard, whether it's EPA, or DOE, or somebody else, but, really working to get all of these things down to the lowest level possible. I know that's what you want to see, too, and I wanted to get that statement in here just very briefly.

Ms. Meyer, talking about your points here, you made several points. I agree with them. Let me comment on them very briefly.

Point 1, determining the radioactivity in the area, I think it is important that we have separate monitoring of this and separate assessments made of it. I'm not trying to make difficulty for anybody in particular. I'm just trying to make sure that we have an independent assessment that things are cleaned up and that we have an independent monitoring.

Point 2 that you made, I think that the bill that I have in with Congressman Luken right now, which the Senate number on it is S. 892, would accomplish much of your recommendation on point 2.

On point 3, this idea of installing monitors that you mentioned in all directions of the plant, I think that has to be carried out and carried out expenditiously.

Point 4, let me elaborate just a little on point 4. I had a meeting in my office last Thursday with the Secretary of Energy, Mr. Herrington, and I received his very personal commitment. We talked about this at considerable length, about making certain that we do cleanup at FMPC. And I'll support whatever expenditures required to do this. You know, we're spending, during this administration, some $2 trillion for defense, and we need those. We need extra expenditure for defense. We could argue about specific parts of it, but, certainly, in all this production process that we're going through here to get an adequate defense, certainly the few million dollars that we would expend to make sure that communities and workers on the site are taken care of is a pittance compared to the overall amount that we are spending.

And, so, I pledged to Mr. Herrington, Secretary Herrington, last Thursday also that I would do whatever I could at our end of the Avenue in Washington to make sure that we had adequate funding and/or legislation, as required, to make sure that these things get done. And, so, we do have his commitment to back a cleanup of the situation out at FMPC.

When we had problems last year, did DOE or NLO ask or seek counsel with you on what your thoughts would be with the workers in the plant who are there every day—they see where the dust is coming from; they see what the flow of things is around the plant—were your suggestions ever requested or considered in how the situation would be cleaned up?

Mr. **Branham**. No, sir, at no time did the Department of Energy or NLO even as much inform the Council or its membership of the existing problems.

Senator **Glenn**. You were not even told of the existing problem?

Mr. **Branham**. No, sir. I was informed formally in the most uninformed manner that you could possibly imagine. On December 13, something to this effect, quote, by the Director of Industrial Relations: "Gene, you realize we've had a problem up in the plant 9 dust collector recently." This was after it had been on television, and newspapers, and there had been inquiries. There had been public statements.

Senator **Glenn**. Well, that's a bit of a shock, because I thought you were kept aware of it. I was concerned about whether you were asked to contribute to the solution.

Mr. **Branham**. No, sir, we were prevented intentionally, as we perceive it, from knowing.

Senator **Glenn**. Well, OK. I think there's a time out there, and I know we still have representatives of the different groups in the room here, and I think it's time out there. We're going to be going to a new contractor. It's a new start. You have an onsite representative out there from DOE that was not there in years past. And I think now is the time for a new start and for making everybody a team out there at FMPC, and making sure that everybody is aware of the problems and contribute to the solution of these things also.

Let me ask another question. NLO claims that injury and illness rates at FMPC are very low. Do you agree with that?

Mr. **Branham**. No, sir.

Senator **Glenn**. Are yours higher than other plants or lower? What's the industrial average, and what's your average, do you know?

Mr. **Branham**. Well, this Council isn't privileged to the actual documentation. Those reports are, in our opinion, misleading.

Mr. **Sea**. Let me attempt to address that. The rates that have been reported by the Department of Energy and NLO are just that. They are reported rates, and not of injuries and illnesses, but of what are called lost time injuries and illnesses.

Let's go into that a little. What is a lost time injury and illness? This is defined by the DOE in a document called the ERDA Manual as an injury or illness that results in one complete lost work day, meaning that if you have an injury or illness in which you report to work every day, even if it's for only 5 minutes, it is not recorded as a lost time injury or illness.

Senator **Glenn**. If I might interrupt.

Mr. **Sea**. OK.

Senator **Glenn**. That's sort of the usual industrial accident. You drop something on your foot, or you stick your finger in something that shouldn't be stuck into, and so you're off work for however many days it is.

I think what you're more concerned with out here are these accumulative effects of radiation things that go on year after year, and you can't quantify those. You can't say those are lost time accidents.

Mr. **Sea**. Well, in either case, the problem with injuries is that we have seen a policy at NLO to ensure that workers report for work even if they are seriously injured. In other words, they will—and we have cases of workers seriously injured being brought to work in a prone position.

Senator **Glenn**. You're kidding.

Mr. **Sea**. I'm not kidding.

Senator **Glenn**. To get checked in?

Mr. **Sea**. So that they check into work, and so that the incident is not——

Senator **Glenn**. And then put them on a cart and haul them home?

Mr. **Sea**. That's exactly correct, Senator. So that the injury will not be reported as a lost time injury.

In the case of illnesses, first of all——

Senator **Glenn**. How many times has that ever been done? You mean people were brought in on a litter so they could report in for work, and 5 minutes later they were carted out on a litter and taken home? I find that very difficult to believe. I can't believe anybody with a half-way decent sense of responsibility would do a dumb thing like that. If a person is sick and should be home, they should be at home. Were they really brought in just to be checked in for work?

Mr. **Sea**. That's correct, Senator.

Mr. **Branham**. Senator, that's not uncommon. The prone position may be the exceptional, but bringing someone in is not uncommon at all. We will present documentation at a later date to you to confirm that. These are not allegations.

Senator **Glenn**. Well, OK. We're behind time now about 10 or 12 minutes here, so I don't want to go into all this right now, but your invitation that you made for someone from my staff or me to meet with you out there so we could talk about some of these safety violations, if you can document some of these things here—I can't believe it, that people were brought in sick, actual cases where people were brought in in a prone position to check in for work, and in a prone position were taken back home again?

Mr. **Branham**. These are documented cases. These people will give you personal depositions to that effect. We would not make this statement if we weren't prepared to document it.

Senator **Glenn**. I hope not. That's a pretty serious one.

Mr. **Branham**. Yes, it is.

Senator **Glenn**. OK. Well, we'll talk about that later on.

In the interest of time here, I accept your invitation. So, we can put that on the record. I accept your invitation to come out and get that. The initiatives, I'm glad to have your support on that.

And I do think that DOE's moving. I talked to some of the people here just a moment ago. That's one of the reasons I was away from the desk here. I wanted to find out what the situation is during this transfer period that I think is very important, and DOE is going to have a site manager out there overseeing this. I think that's a good step forward. I would like to see this also be the beginning of a new day in the relationship between management, and labor, and safety, and everything else out there. I think we have a chance to really start over here now that this contract is changing. I hope we do it.

Thank you, Mr. Chairman.

Senator **Cochran**. Congressman Luken.

Congressman **Luken**. Thank you, Mr. Chairman.

I wonder, Mr. Branham and Mr. Sea, with reference to the colloquy just before workers being brought in sick, do you have any affidavits? You don't have any names at all?

Mr. **Branham**. Names? Yes, sir, we have names, and depositions, and documentation.

Congressman **Luken**. But you're not submitting them now?

Mr. **Branham**. No, sir. We would have to violate a security practice by departing the plant premises with them.

Congressman **Luken**. So, you'll give them to us at the plant?

Mr. **Branham**. We would like to have a member of Senator Glenn's staff or himself take them in hand onsite.

Congressman **Luken**. You feel it would be a violation of the security, you would be jeopardizing people's jobs by doing that?

Mr. **Branham**. We feel that it could possibly be interpreted by the Department of Energy as a security violation by taking documentation off the site, and we're not exactly opposed to it. It's on behalf of the national security interest.

Congressman **Luken**. All right. I'd like to turn just very briefly, and that's not a political promise, Mr. Chairman.

The groundwater monitoring plan prepared by Dames & Moore—I'm not a little bit shocked. I'm very much shocked to learn according to our recent reports from the EPA, and what other information we have gleaned, that with regard to the groundwater of the wells that this fiasco continues.

Now, let me outline the history as I understand it. Back in the early 1980's, it was brought to the attention of NLO and, I guess, the DOE, presumably—DOE knows something about what's going on out there—that there was a question about the wells in the vicinity. And the U.S. Geological Survey, I believe it is, Department of the Interior, made a superficial check, and that they did actually measure uranium in the water in various wells. USGS came back with a report and said that further studies had to be made to determine where that uranium was coming from; that they didn't have enough money, didn't have enough resources to check these groundwater flows and so on.

So, then, NLO made a report. Which was not conclusive. Next we were told when all of this hassle came up, because of the bag operation, we were told that Dames & Moore was making a comprehensive survey to tell us, really, what's happening with regard to this well water of the three wells that are contaminated, according to most standards, if not DOE standards.

And, now, we have a report from DOE that says the groundwater monitoring plan prepared by Dames & Moore is inadequate.

Can you shed any light on any of this? Mr. Branham and then Ms. Meyer. If you know?

Mr. **Branham**. No; that's just it, we don't know. We aren't privileged to that information.

Congressman **Luken**. All right.

Mr. **Branham**. If it hadn't been for recent incidents, we would not have known what we know now.

Congressman **Luken**. All right. Do you have something on that?

Ms. **Meyer**. Just that I would like Lisa to comment since it is her well that is contaminated.

Congressman **Luken**. And I think the chairman would like you to identify yourself, Lisa.

Ms. **Crawford**. My name is Lisa Crawford, and I live at 7308 Willey Road.

As we were informed, Congressman Luken, on January 11, that our well was one of the three contaminated wells.

Congressman **Luken**. And that's the first time you were advised?

Ms. **Crawford**. Yes.

Congressman **Luken**. Have you heard anything on that since? That was January 11, 1985.

Ms. **Crawford**. Yes, I've heard a lot since.

Congressman **Luken**. And up to that time you were using that for your drinking water and your home use?

Ms. **Crawford**. Yes; for 5 years. We knew nothing about it. January 9, the people we rented the house from called us. My husband was on his way out, at the time, for a doctor's appointment. And when I got in, I called them, and asked them what did they want. I knew it was something regarding the water, but he didn't go into detail. And at the time I was informed that it was acceptable levels, nothing to be concerned about at all.

Congressman **Luken**. I believe, according to the readings from your well, that you had been using were highest in content of uranium and would be something like 20 or 30 times the safe level as outlined by EPA according to the standards EPA is considering, but, of course, the Department of Energy has its own standard, which may be as high as 100–150 times higher than those of EPA.

But you have received no more information about the Dames & Moore study or any of that?

Ms. **Crawford**. No.

Congressman **Luken**. As I told the chairman, I wasn't going to pursue these matters extensively with these witnesses who have given self-explanatory testimony here, but I'm very concerned. I want those in the room from the Department of Energy and the contractor to know that personally I'm extremely concerned that we continue to bat this ball around.

The Dames & Moore was advertised as the comprehensive authoritative study that would tell us what's going on with those wells and where that water is coming from and where than uranium is coming from. And, now, when EPA comes in and says that the Dames & Moore study isn't worth a hoot, it looks like we're back to ground zero, and we're still going round and round.

Thank you, Mr. Chairman.

Senator **Cochran**. Thank you, Congressman.

We appreciate very much this panel being here today to help us in our hearing. Thank you for your cooperation with the Committee.

[Mr. Branham's prepared statement with attachments follows:]

FERNALD ATOMIC TRADES & LABOR COUNCIL
Affiliated with The A. F. of L. - C. I. O.

April 22, 1985

TO: Senator John Glenn
SUBJECT: The FATLC'S prospective o NLO management and DOE over sight.

Thank you Chairman Cochran
Senator John Glenn
Congressman Luken

for extending labor this opportunity to appear here. FATLC testimony will be much less formal than that of NLO and DOE but many times more factual.

I, Gene Branham, President, FATLC, am a member of the operating engineers international union. My job classification is heavy equipment operator and I'm a 32 1/2 year NLO employee.

Now, I would like to introduce the members of my delegation:
Robert Schwab - Chairman Union Safety Committee, NLO
Geoffrey Sea - Health & Safety Consultant to FATLC
David Ortley - Health & Safety Consultant for ICWU

My testimony will address four areas which you've indicated you would like labor's reponse. But first, I would like to present a brief over view.

From labor's prospective NLO managerial history is incompetent and a strong collusion between DOE and NLO to cover up life threatning effects of that incompetency.

Today, I will present an outline of the problems as labor sees them and the corrective actions we think necessary are needed. To do full justice to the historical record of lies, cover-ups, accidents, injuries and illness would take many months of testimony. Therefore in the interest of time, I will submit a follow-up in a much more detailed testimony in written form in the next ten days.

LABOR'S PERSPECTIVE OF PROBLEMS

1. We fear the largely unmonitored exposures we have had, and which we continue to receive; exposure to radioactive compounds including compounds of uranium, plutonium, radium, technetium and thorium; and non radioactive toxic chemicals including asbestos, TCE, PCB's, numerous acids, fluorides, sludge, solvents, and heavy metals.
2. We fear the cancers and leukemias known to be associated with these exposures, and which are only now starting to appear as the latency period from early years of plant operation begins to expire.
3. We fear the chronic lung and kidney diseases that are now appearing form years of exposure to dusts and fumes.

4. We fear for the genetic health of our children and their children, and we fear that many of our younger workers -- a majority of our members are under 25 years old -- and are in the early stages of family planning.
5. We fear for the health and vitality of our community.

NLO MIS-MANAGEMENT

1. Emphasis on production over safety .

   Example: Incident at Plant 9 dust collector. A foreman ordered instrument sensitivity reduced from 10 to 5. When safety alarm continued to sound, the foreman bypassed the safety alarm altogether.
2. Ignorance of the complex technologies entrusted to them.
3. Total arrogance and egotistical attitude that supercedes the concers for workers safety.
4. Incompetence - due to the distorted promotion policy.

   Example: Procurement division which consists of four departments which employs approximately 30 salary personnel, each with the authority to assign and direct the work force. Not one of these people has ever performed one hour of work in the field. This includes from procurement division head down to the most recently hired clerk. Although there is no less that 25 men in this department, who have over 1/4 century experience.

5. Dishonesty and tendency to hide behind national security in order to cover up known mistakes and errors.

DOE RESPONSIBILITIES

1. Despite the many failures on the part of NLO management the primary responsibilites for the problems we now face can be traced directly to the Department of Energy.
    a. It is DOE that owns the plant and its materials.
    b. It is DOE who has allowed the plant to become run down and deteriorate to the extent that we are not only a danger to ourselves but to the surrounding communities.
    c. It is DOE who monopolizes regulations of the Fernald site and has prevented any true over site for many many years.
    d. It is DOE who has erected the wall of material security for management to hide behind.
    e. It is DOE who has consistently implemented policies that benefits its contractors while endangering the workers and the communities.
2. Specifically, DOE has engineered a contracting system that eliminates legal liability for negligent actions.
3. A system of safety inspection and appraisal that is a joke and an insult.
4. A system of reporting and recordkeeping seemingly designed to hide evidence or wrongdoing and prevent mistakes from being caught.

5. A system for public relations designed to keep workers and the public both misinformed and unimformed.
6. Guidelines for monitoring and medical follow-up designed to increase the occurence of disease and prevent its detection.

CORRECTIVE ACTIONS

1. We see the Glenn-Wirth bill as an important first step in stripping DOE of its monoploy over radiation health effects research.
2. We think the bill should be broadened to include areas of research other than epidemiology. These include: environmental research, health registries, including the transuranic registry, human clinical research, animal studies.
3. We propose that the Atomic Energy Act be ammended so as to eliminate the exemption of atomic workers from OSHA jurisdiciton.
4. We call for the immediate placement of worker representatives on all DOE research, advisory and investigative boards.
5. We call for a comprehensive investigation of the DOE contract and administration system with an eye toward concrete recommendations for changing this system. Specifically, we recommed that the following costs of operations become non-reimbursible by DOE:

a) grievance arbitration costs
b) workers compensation costs
c) legal defense costs
d) fines and penalties
e) public relations costs
f) labor relations costs during strikes
g) the costs of corrective actions such as cleanup of illegally dumped waste

We, as taxpayers, should not be responsible for paying for the improper and negligent actions of government contractors.

6. We call for a comprehensive review of national security restrictions as they relate to the revelation of health and environmental problems at federal facilities. We feel an immediate need for clarification of the security restraints on DOE contractor employees, in language that ordinary workers can understand.

7. Until such time as regulatory authority can be transferred from DOE, we ask for immediate changes in DOE's health and environmental control program. To name a few: ATLC offers following seven suggestions:
   1) a system of fines and penalties for contractor violations
   2) a system of followup on appraisal recommendations
   3) regulations covering toxic chemical exposure
   4) a urine uranium standard
   5) a tenfold reduction in radiation exposure standards
   6) a recordkeeping system for chemical exposure, and for data obtained from urinalysis and whole body counting
   7) a comprehensive radiation exposure registry

8. We have many specific recommendations for improving conditions at the Fernald site. We have made many of these recommendatioins at company-union safety meetings, but we have been totally ognored. Other recommendations are contained in a comprehensice bargaining package. We have asked NLO to reopen the health and safety section of our contract, immediately, so that we may negotiate over these iems. NLO HAS REFUSED.

9. We ask for direct congressional intervention over the next year, to oversee the transition to a new contractor to maintain the integrity of plant's records.

10. We endors the five initiatives of Senator Glenn's and to thank the Senator for showing rare political leadership in protecting the lives and health of working people.

11. We ask specifically that a representative of Senator Glenn's office meet us on the plant-site so that we may transfer important documentary evidence of safety violations. We require this arrangement because it would be a violation of company rules for the union to remove any documents from the site and DOE may preceived this as a security infraction.

ADDITIONAL FACTS

1. In the summer of 1981, Director of Health and Safety of National Lead, Mike Boback, was made aware of contaminated wells that contained abnormal uranium deposits. Neither labor, the surrounding community, nor any responsible agencies were made aware of these test results.

2. Since 1951 when the Fernald site initiated its operation there has been (in accordance to DOE records) 210,000 pounds - that's 105 tons of uranium dust leaked into the atmosphere, another 150,000 pounds leaked into the water and still another 675,000 pounds are missing and unaccounted for.

3. 1966 - hex fluoride release of approximately 3,000 pounds. Was reported in 1985--19 years later and then only when confronted with proff.

4. This indicates a lack of DOE oversite and mismanagement on the part of the present contractor and a personal insult to every tax payer in the United States for not sharing this critical information. These are the people that now ask you to believe them when they publicly state - there is no reason for alarm, there is no danger involved.

You'd have to eat a teaspoonful a day for it to hurt you.
Director of Health and Safety - MIKE BOBACK

The most dangerous thing you could do with our uranium is drop it on someone's head.
Assistant Plant Manger - WELDON ADAMS

These are educated men with 30 plus years employment at National Lead that hold responsible positions in top mangement.

This should indicate to this committee not only the arrogance but the ignorance and lack of concern for the workers safety.

In conclusion, as President of the Fernald Atomic Trades & Labor Council, I would like to thank you
Mr. Chairman Cochran
Senator Glenn and
Congressman Luken
and the other members of your committee for extending to labor this rare opportunity to be heard.

This delegation will now answer any questions the committee wishes to ask.

Gene Branham

Gene Branham
President, FATLC

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HLO, INC.
HEALTH & SAFETY DIVISION
INFORMATION FORM

This form should be used to register a formal complaint as well as to respond to a complaint. It may also be used to make a suggestion, to report an observation, or to respond to either of these. Please indicate the purpose by checking the appropriate block below.

☒ Complaint ☐ Suggestion ☒ Observation ☐ Response

Subject: SAFETY TR[illegible] OF PEOPLE IN PILOT PLANT.

Date: 4-23-85

To: BOB WEIDNER From: DANIEL T. DAY

Message: ON 4-18-85 AT 1PM I WAS TOLD TO REPORT TO THE PILOT PLANT TO REPACK A MILL SCREW. I INFORMED MY SUPERVISOR I DID NOT HAVE TRAINING ON A SCOT AIR PACK OR RUBBER SUIT. HE TOLD ME TO REPORT ANYWAY. WHEN I ARRIVED THE WORK AREA WAS FILLED WITH H F FUMES. THEY WERE TRYING TO GET THE PPM DOWN SO WE COULD ENTER. ANOTHER MILLWRIGHT HAD TO ASK TO HAVE IT MONITORED BECAUSE OF IRRATATION TO HIS FACE. PRIOR TO MY ARRIVAL A CHEM[illegible] OPERATOR WAS BURNED IN THE SAME AREA.

ALL THE CHEMICAL OPERATORS AND SUPERVISORS AND AREA MAINTANCE PERSONNEL ARE TRAINED IN THE SAFETY EQUIPMENT.

MY QUESTION! SHOULD MAINT. PERSONNEL PREFORM [illegible] IN A BUILDING WHICH HAS CONSTANT [illegible] WHEN THEY HAVE NO SAFETY TRAINING ON ANY OF THE PROTECTIVE EQUIPMENT OR THE BASIC KNOWLEDGE OF KNOWING [illegible] EXITS I.E OR ESCAPE ROUTES ARE LOCATED.

OPINION! PRODUCTION SCHEDULES SEEM MORE IMPORTANT THAN PERSONNEL SAFETY!

NO.	DISTRIBUTION OF COPIES
1	Addressee
2	Health & Safety (RECORD COPY)
3	Originator

Addressee shall respond within 15 days to the originator of a complaint, reporting action taken or planned.

NLO, INC.
HEALTH & SAFETY DIVISION
INFORMATION FORM

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☑ Complaint ☐ Suggestion ☐ Observation ☐ Response

Subject: Safety

Date: April 1, 1985

To: Bob Wiedner From: Harry J. Easterling

Message: A production foreman named Keith Partridge unhooked an air line which was connected to an air line respirator that was being used by me Harry J. Easterling while working under the jaw-crusher. Mr. Partridge failed to inform me that he was going to disconnect my air line. This is the second known safety offence of Mr. Partridge.

NO.	DISTRIBUTION OF COPIES
1	Addressee
2	Health & Safety (RECORD COPY)
3	Originator

Addressee shall respond within 15 days to the originator of a complaint, reporting action taken or planned.

NLO-H&S-2060 (REV. 12/17/82)

FERNALD ATOMIC TRADES & LABOR COUNCIL
Affiliated with The A. F. of L. - C. I. O.

April 2, 1985

On 02-21-85, Health and Safety Technician, Mr. R. Gill, entered Plant 8 for the purpose of monitoring Dust Collector's G43-27 and G43-29. Upon entering the plant, I escorted Mr. Gill to Dust Collector G43-27.

I requested that Mr. Gill monitor the whole interior of the Dust Collector since the operator's would be going inside of the Dust Collector to clean and to run a dye test on both dust collectors. All doors were open on both sides of the Dust Collector.

Mr. Gill monitored Bag 1,2,3,4 and 7. He then proceeded to fill out his entry permit. I asked if he was going to monitor the opposite side. He said , "I have already done that". I said, "Mr. Gill I was standing right here with you and have been watching you; you have yet to monitor the other side." I then asked, "Mr. Gill will you please monitor the other side." He refused to answer me. I again asked him the same question again and he refused to answer me. He filled out the entry permit and went to monitor Dust Collector G43-29. I followed him to G43-29. Mr. Gill monitored the south side of G43-39 but not the north side. I requested that he monitor both sides in the presence of Mr. Jim Satchwill. Mr Satchwill proceeded to open the north side of G43-29 which took a little more than a minute. When Mr. Satchwill was finished, Mr. Gill was gone to the control room. I followed Mr. Gill to the control room. In the presence of my supervisor, I asked my supervisor to ask Mr. Gill why he would not monitor both sides of the Dust Collectors. Mr. Gill would not answer my supervisor. Mr. Gill finished his paper work and left.

I rejected and my area supervisor rejected his readings and requested another technician to re-monitor the Dust Collectors. Before the technician, Mr. Roger Grant, could perform the monitoring, the blow ring on G43-27 was cleaned by Mr. Jim Satchwill and Mr. Earl Sullivan cleaned the blow rings and bag on G43-29/

Mr. Grant proceeded to monitor the Dust Collector in question (both sides) and the resulting figures of his and Mr. Gill's are attached.

James T. Simenser
Union Health Representative

Robert Schwab
Chairman Union Safety Committee

RS/bg

FERNALD ATOMIC TRADES & LABOR COUNCIL

Affiliated with The A. F. of L. - C. I. O.

April 2, 1985

On 02-22-85, Health and Safety Technician, Mr.Ron Gill, was requested to monitor Dust Collector G43-27 in preparation of a dye test. I requested that I be present when the monitoring was done. The request was made to my supervisor who in turn relayed my request to Mr. Gill.

The request was made under established procedure of D.O.E. which states:

> Advise employees or their authorized representative that they are to be provided with an opportunity to observe monitoring or measuring for toxic materials or harmful physical agents and have access to the results thereof.

After Jerry Erfman, my supervisor, requested I be present, Mr. Gill immediately began to monitor G43-27 without me being present, or my supervisor being present. He was over 1/3 done when my foreman and I approached him. We both asked him what his highest reading was. He refused to answer my supervisor or me. He completed the entry permit and left.

James T. Simensen
Union Health & Safety Rep.

Robert Schwab
Chairman Union Safety Committee

ATTENTION: Mr. R.B. Weidner

Important additional information pertaining to the above named individual's performance available and should be included in your final decision.

RS/bg

ATTACHMENT 12

Greater Cincinnati Occupational Health Center
A PROVIDENCE HOSPITAL

Suite 203
Providence
Medical Plaza

2450 Kipling Avenue
Cincinnati, Ohio 45239
(513) 541-0561

REC

APR

Mitchell Singal, M.D.
4676 Columbia Parkway
Cincinnati, OH 45226

Dear Dr. Singal:

I am writing to summarize the ATLC's request for the NIOSH Health Hazard Evaluation at Fernald, Ohio NLO site. This is a minimum request and is not meant in any way to limit NIOSH's study. As is always the case, NIOSH has the responsibility to comment on and to study any potential health problems that it finds during the course of its investigation.

Date of meeting: March 21, 1985
Time of meeting: 10:00 a.m.
Place : Conference Room

In attendance:

Mitchell Singal	NIOSH
Elizabeth Ward	NIOSH
Geoffrey Sea	FATLC
David Egilman, M.D.	Greater Cincinnati Occupational Health Center
Tom Sweasey	Greater Cincinnati Occupational Health Center
Robert Schwab	Chairman Union Safety
Gene Branham	President FATLC
John Nickell	I.A.M.
John Webster	International Chemical Workers Union
James Keafsnyder	DOE-ORO
Robert Weidner	NLO Health, Safety & Env. Div.

With respect to each area that the ATLC requests investigation, we wish NIOSH to respond to three specific questions:

A. General question to be applied to each specific health hazard question.

1. Is the question answerable from current studies, either of this facility or other related facilities, or studies of other similar exposures in other populations?

2. If the answer to question one is no, is the question answerable from existing or attainable data at the NLO facility? By existing data we mean medical records, exposure data or a mortality study that might include traditional methods for evaluating mortalities. By attainable data we mean cross-sectional studies on current or from past employees including x-rays, pulmonary function test, blood tests, urinalyses, etc.

3. If the answer to question two is yes, either the data exists or is attainable, we ask NIOSH to answer the question, "How can the question be answered?" We understand that NIOSH has financial constraints and other constraints (staffing constraints, etc.), and may not be able to conduct all relevant studies. If we ask a question pertaining to a potential health effect, and it looks answerable from data available at the site, we would like to know how NIOSH would suggest that the answer be obtained. The ATLC can deal with NIOSH's response as a recommendation on how the question can be answered from either the DOE's perspective and budget, or privately funded research. We also request specific recommendations on how our question be answered from existing data or recommendations for future industrial hygiene monitoring, or medical data accumulation. What potential cross-sectional studies could be done on data that exists or data that could be generated from exams of workers and finally, how would you suggest that those studies and/or testing proceed?

B. Specific health hazards

We have questions in four specific areas:

1. potential health problems

2. potential safety problems

3. general questions with respect to industrial hygiene procedures, data, and medical monitoring.

4. ethical questions pertaining to data handling issues and drug screening.

In each area I will briefly review the reasons that the union has for requesting the study and the types of studies that the union feels are warranted. We would like NIOSH to respond specifically in each case, to the three questions listed in Section A above.

1. Pulmonary Fibrosis and Emphysema

a. Animal data

The first study of pulmonary fibrosis from uranium dust exposure was a 1970 study in monkeys, dogs and rats performed at the University of Rochester funded by the AEC, and published in Health Physics. One wonders whether there was other data available to the AEC about lung disease because NLO has had a fairly comprehensive x-ray and pulmonary function program since the 1950's. As a professional, I would not necessarily have thought of doing pulmonary function tests and chest x-rays on a population working with uranium. I, therefore, wonder if other information was available from animal studies or other worker populations, that indicated that exposure to uranium dust caused lung disease, that precipitated the company's x-ray surveillance program in the 1950's?

b. Human data

In the late '70s and early '80s there have been three studies of groups of workers exposed to uranium dust The groups studied included, uranium mill workers, uranium miners, and NLO workers (Wilson study). All three indicate that non-malignant respiratory disease is in excess in these cohorts without an excess of lung cancer. Most of the uranium that these workers were exposed to is natural.

The fact that there was no excessive lung cancer indicates that the lung disease excess was not confounded by cigarette smoking.

In addition, over the past four months, we have examined about 15 NLO workers at GCOHC and about 10 have lung disease. Five or six have pulmonary fibrosis and/or restrictive disease. One of those has had a biopsy proven fibrosis in November 1984. We are not so clear about whether the fibrosis is a pure uranium dust effect or confounded by other exposures in the facility. One problem with the Wilson's study and a major problem with the plant's hygiene programs is that there was no monitoring of non-uranium exposures. It is difficult to evaluate exposures other than uranium dust. We request a retrospective case control study based on x-rays and pulmonary function tests that are available in medical records looking at three or four major exposures; uranium dust, acids and other chemical exposures and asbestos.

Secondly, we think that a cross-sectional study of current workers and as many retired workers who still live in the community looking at the development and progression of pulmonary fibrosis is indicated.

Third, there is a need for a mortality study. This would help answer questions on three or four of the health areas we are concerned about, but would obviously include mortality from non-malignant respiratory disease.

2. Cancer

First we request a mortality study which will cover excess cancer mortality at NLO. Wilson makes reference to cancer mortality at NLO but DOE and ORAU researchers have refused to tell the Union if a mortality study has been done at NLO. One of the DOE reports mentions a 36% excess in digestive cancers at NLO. Workers at NLO are exposed to uranium dust, asbestos and radiation, so it is reasonable to ask if there's a cancer excess among workers. In addition to the mortality study, if it is possible to accumulate enough cases of leukemia and hepatic cancer specifically, we request a case-controlled study looking at thorium dioxide and radiation exposures. We are aware of one case of hepatic carcinoma from the facility in a worker who had thorium exposures. There may be more and we ask that NIOSH look for more cases.

3. Kidney disease

There are several animal studies, two human population studies (at TNS and the Cotter Mill) that indicate that uranium is a kidney toxin. In both of the human studies it was felt that a health hazard existed due to uranium effect as evidenced by increases in beta 2-microglobulin excretion in the worker populations. Worker records evaluated at GCOHC indicate that many NLO workers have levels of urine uranium as high or higher than the levels at the Cotter Mill or TNS. We therefore request that kidney disease be looked at in several ways. First, we request a cross-sectional study examining current workers for beta-2 microglobulin, creatinine clearance, urinalysis, and (using Hemstreet's methodology) early signs of malignancy.

We request a case controlled study of NLO records, including follow-up of workers with abnormal urinalysis. As far as I can tell from the records reviewed at GCOHC, NLO has not followed up on abnormal urinalysis and workers with abnormal urinalysis results have been told that "their medical records indicate no systemic disease."

The third question we have in the kidney disease area is what is the uranium standard at NLO and what should it be? The facility currently uses a 40 micrograms per liter action level. In conversation with NLO staff, I've been unable to determine what that standard is based on. The last draft NRC recommendations for mill workers exposed to uranium were 15 and 30 micrograms per liter with different actions required at each level. We request NIOSH's recommendations on what the standard should be. Because the data for the uranium standard in the NCR proposal is based on 1950's animal experiments, we question its validity. We think that there is not enough human data available at the present time to make a reasonable estimate of what the uranium urine standard should be and that is the main reason we are asking for the kidney disease studies. Since the DOE's been conducting "experiments" on about 100,000 workers in their facilities the last 30 years, we think it is appropriate to actually look at the workers and find out what's been happening to them. We would also like to know if NIOSH feels there should be different standards for soluble and insoluble uranium.

Finally, what would NIOSH recommend as a kidney disease medical monitoring program for workers in the facility?

4. Safety problems

There is frequently overlap between health and safety problems in this facility, because trauma frequently involves exposure to metal and/or molten uranium.

a. Injury data system

We don't know what data system exists at NLO, but GAO review of DOE facilities showed that those plants had four times fewer accidents reported than the average chemical facility. We find this curious. It is the union's feeling that this facility is not four to five times safer than other chemical facilities in the country. We feel there is a problem in data accumulation. We have one or two clues to where the problem is. First, we are not aware of any system for reporting and documenting trauma. Secondly, there is a tendency to want to get workers back to work and not have compensation claims filed. In order to do this, there is an aggressive program on the part of the company medical department to get workers back to work after they are injured, even if they are not performing any tasks. If workers stay at work, never lose time even though they may be laying in a bed in the medical facility, there is no lost time accident reported and, therefore, there is no data we can rely on to know whether there is a serious safety problem or not. We ask NIOSH to develop recommendations on a data system for injuries.

b. Procedures for uranium trauma handling

We request that NIOSH recommend standard medical surgical procedures for dealing with uranium trauma. A specific problem at NLO is weekends and nights, when the medical department is closed. In one case, someone went five months with uranium in his extremity and no follow-up was provided. There was no recording of this episode even having occurred on any reporting system. Secondly, there was no follow-up of the individual by physician personnel to determine what the medical care should have been. We think that all injuries from uranium, should be seem by medical personnel and not treated solely by para-professionals. We don't necessarily have an objection to emergency treatment by para-professionals, but we think there should be supervision by physicians.

We'd like to know what medical monitoring should be done for beta and gamma radiation at sites of injuries and what follow-up is recommended. How frequently should uranium levels in the urine be obtained and what concommitant urinalysis should be performed? This question applies to uranium injuries and dust exposures.

One more specific problem is the Rockwell area. In the Rockwell area workers are instructed to duck as the control mechanism when moving the pots filled with molten uranium metal explode. We know of at least one worker who was burned with molten uranium on the face as a result of insufficient ducking. We would like NIOSH to specifically comment on ducking as a procedure for industrial hygiene control for molten uranium exposures. We'd also like NIOSH to comment on follow-up of uranium burns at this facility and determine how many other people may have been burned or are at risk for burns.

c. Industrial hygiene

First, what industrial hygiene data exists? Secondly, has there been any effort to correlate environmental biological and medical monitoring. It is our understanding that the medical records and exposure records are completely separate and that medical department personnel do not examine exposure information. This leads us to question, NLO's ability to make correlations between exposures and health effects. We request that NIOSH comment on the separation of exposure data from medical data, or whether it might be more appropriate to systematically attempt to correlate exposure and biologic and medical monitoring data. In other words, what potential exists at the facility, or anywhere else, for developing a data base that on an ongoing basis, correlates exposure, environmental and medical monitoring data? We request an evaluation of the health physics program with respect to standards and monitoring programs for uranium, radiation, plutonium, thorium dioxide and other radioactive isotopes. Plutonium exposures at NLO were a surprise to us and we are not sure what other isotopes might be present at NLO. We'd like you to find out and suggest appropriate procedures for monitoring those exposures.

d. Non-radiation exposures

Finally, we'd like recommendations for non-radiation related exposures. As far as we know, there is no monitoring for non-radiation, chemical exposures, no monitoring for asbestos exposure, and no monitoring for other acid exposures. We'd like to know what exposures merit monitoring and what type of monitoring, either biologic or medical. We suggest an evaluation of the waste pits and any potential hazard from cleaning the pits.

Another specific request is the evaluation of the fire hazard and criteria for evacuation and re-entry in the milling operation and in other areas of the facility where uranium dust catches fire. Historically, there was an average of one fire per shift that lasted between fifteen minues and two hours, frequently filling the room with smoke. The room was only evacuated on one occasion. There still are fires at NLO and we'd like to know what the criteria for evacuation should be, what the criteria for re-entry should be, what the respirator program should be, and what the monitoring program should be. We request an evaluation of asbestos exposures in the facility. We know NIOSH does not like to do asbestos exposure evaluations and we would like to specifically note that this facility is not subject to OSHA's requirements for asbestos exposure.

We are also interested in hydrofluoric acid, nitric acid, sulfuric acid exposure in the facility.

e. The respirator program

We'd like an evaluation of the respirator programs. Specifically, we request recommendations on fit-testing, beard policy, individual training, cleaning and storage of respirators.

f. Data handling issues

When a worker's physician sends a standard medical release to NLO, the facility does not release any exposure information. They also fail to tell the treating physician that they are not sending a complete record. In addition, treating physicians do not receive any environmental exposure data. Is this correct procedure?

There is a state law requiring occupational disease be reported to the State Health Department and we would like to know if any such reports exist at the facility.

g. Non-employee exposure

There are many contract employees who work at NLO, for example, asbestos workers and pipe fitters. These men work with asbestos and other toxic materials at NLO. What monitoring is done on these workers? What environmental monitoring is done on their exposures, what medical monitoring and what do you recommend? Is there a cataloging of these people?

h. Data quality issues

A sensitive area at NLO is the quality of the data. Since it is relevant to NIOSH to know what the quality of the data is in making any determination about possible health effects, we would like you to comment on data quality. Information we have obtained from a hygienist at NLO is that the following procedure was previously employed during monitoring:

The hygienist performed environmental monitoring and if the exposures were above the permissible exposure limit (PEL) on his report to his supervisor, he was told by the supervisor to go back and do it again until "it was correct." He was repeatedly told to go back and do it again until the exposure levels on his report were below the PEL. This pattern of response to potential overexposures occurred in the dust releases from the stacks. When the radiation monitor went off in one of the stacks, NLO responded by turning the sensitivity down by a factor of ten. This type of response to hazards monitoring leads us to question lab procedures of biologic monitoring and perhaps even the quality of urinalysis data.

i. New improvements

We have been informed that the company is planning to engage, in between 50 and 250 million dollars of improvements. NIOSH has a whole division of environmental engineering and control and we would like to invite them to look at the plans for environmental control at the facility and comment on their adequacy.

j. Medical monitoring

What programs exist? What programs should exist? What are the procedures for informed consent and release of data. NLO performs secret urine drug screens. They take urinalyses, that the worker is told are going for urine screening for uranium and perform drug screens on them. We have several questions relative to this procedure. Could you comment on its ethics? This is done without informed consent. Secondly, could you comment on the release of the results, since these and other results are not routinely released to the worker? In other words, we have workers who have abnormal urinalysis and abnormal chest x-rays who are not informed of the results.

Could you comment on the quality of this screening. It is our understanding that two naval officers were removed from their commission in the navy because of a similar program for eating bagels with poppy seeds which show up as heroin or morphine in the analysis.

k. Other information

What health studies are being done at NLO? What studies have been done? What studies are being planned to be done - that relates to any of the above or any other health and safety hygiene problems? ORAU and UNC researchers have refused to inform the union of types of studies they are conducting at NLO.

l. Body snatching

We would like to inform NIOSH of the body snatching program. In this program NLO workers had their organs removed and sent to NLO or DOE facilities when they pass away or ~~have an organ~~ removed surgically. This is done without informed consent. We request that NIOSH determine the extent of this program, if data from this "program" can be used to answer the questions that we have mentioned. We also have some ethical questions about this program. Should the families of the people be informed of the fact that their relative's organs were taken and sent for analysis and have a copy of the analysis sent to them with some type of explanation?

Since NIOSH is viewing this as a regular HE, under the hazard evaluation authorities, NIOSH is not limited to studying the items that the union views as problem areas. The OSH Act does not find it the responsibility of the workers or their consultants to know everything that might be wrong at a work site. It is NIOSH's role as an expert in the field, to initiate studies relevant to questions that might evolve in the course of its investigation. This letter is in no way meant to limit NIOSH's investigation. If during your walk-through or examination of any of the data, NIOSH discovers other problems, we want them pursued vigorously.

Sincerely yours,

David Egilman M.D. MPH

Dr. David Egilman on behalf
of the ATLC at NLO

FERNALD ATOMIC TRADES & LABOR COUNCIL
Affiliated with The A. F. of L. - C. I. O.

April 26, 1985

TO: Senator John Glenn

SUBJECT: Follow-up on Fernald Trades & Labor Council testimony at the Congressional Hearing held on April 22, 1985 in Cincinnati, Ohio.

The medical records of the following employees will verify labor's position; plus a willingness on their part to cooperate has been expressed. These medical records are the property of the contractor and the Department of Energy, therefore labor does not have access to these records. They are as follows:

Employee name	Injury	Approximate years
Roger Biddle	Knee	1983
John Baldwin	Neck	1979 - 1980
John Taylor	Burns	1953 - 1954
Tim Taylor	Back	1984
Marty Eckstein	Finger	1984
Lee Holiday	Hand	1981
Don Mc Cool, Jr.	Neck	1984
Paul Rose	Neck	1968 - 1969
Carl Kirstein	Rib	March 5, 1974
George Walker	Leg	1958
Bob Austin	Broken arm	1956 - 1957
Estell Lee Peters	Finger	1957 - 1958
Vernon F. Gessendorf	Hands	1972 - 1973

These sixteen incidents are insignificant in number in comparison to actual cases over the past 33 years but they are representative of the policies and medical practices that the contractor has implemented for over the last quarter of a century and beyond.

Gene Branham

Gene Branham
President, FATLC

FERNALD ATOMIC TRADES & LABOR COUNCIL
Affiliated with The A. F. of L. - C. I. O.

April 26, 1985

We have chosen the following three cases by way of example:

Robert Fisher — Maintenance machinist

Mr. Fisher's right index finger was twisted out of the socket. The accident occurred over the weekend. The surgery also was performed over the weekend and Mr. Fisher was hospitalized for approximately thirty-six hours. He reported to work the following day (Monday) on second shift. Each day he was transported to the machine shop for approxmately one hour. The remainder of the shift was spent in medical in bed for approximately two months.
Approximate time of the incident: 1957 to 1959.

Earl Gene Branham — Heavy Equipment Operator

While participating in sports on two separate occasions, I received a severe leg and ankle injury. Each day a car from National Lead would pick me up at my house between 9:30 and 10:00 a.m. I would lie in the prone postion in the back seat with pillows under my leg (for elevation, per doctor's instructions) while I was brought to work. I would sit in the office for about two hours and transported back home in the early afternoon.
Approximate time of the incident: 1960 - 1966.

Bob Austin — Industrial Truck Operator

Mr. Austin broke his arm while on the job. He was brought to work and spent the next many months working in the transportation office in the capacity of dispatcher, office clerk and foreman.
Approximate time of the incident: 1957 - 1959.

FERNALD ATOMIC TRADES & LABOR COUNCIL
Affiliated with The A. F. of L. - C. I. O.

April 25, 1985

TO: Senator John Glenn

SUBJECT: By-products hazardous waste pits K-65 at the
Fernald, Ohio DOE Site

Pits 1, 2, 3 and 4

These pits originated in the very early 50's. As they were filled, they were used for any and all materials, not segregated but dumped together. The materials ranged from filter cakes, uranium chips, uranium ingots, many mixtures of various solvents, numerous acids, lime slurries, oil and water mix, brime, contaminated scrap metals, thorium, asbestos, PCB's, fluorides and Rockwell burn out scrap. Also daily collection of garbage dumpsters which is not separated and contaminated items of all nature collected throughout the site. The disposal of wooden skids that were either too contaminated to reclaim or were beyond repair were also deposited in these pits. At this time, there were no other methods of disposal except an incinerator which handled loose leaf paper only.

It must be noted that these materials were not monitored - there were disposed of IN BULK.

All other materials; garbage, by-products - liquid or solid were deposited in Pits 1, 2, 3 and 4. Although it was not full, recent restrictions have terminated the use of Pit 4 as of March, 1985.

I personally have worked in and around these pits from day one and continue to do so as of today.

The previously listed items and many more which I have no knowledge of what they were are now buried in Pits 1, 2, 3 and 4.

It is my opinion that these solid uranium metals and the uranium chips present the most long term dangerous effects.

Gene Branham
President, FATLC

GB/bg

FERNALD ATOMIC TRADES & LABOR COUNCIL
Affiliated with The A. F. of L. - C. I. O.

April 25, 1985

TO: Senator John Glenn

SUBJECT: Employee investigative report on Plant 9 dust
collector taking place on November 29, 1984 at 5:50 pm.

A full in depth employee investigative report is enclosed in the appendix.

At this time we would like to address one specific issue relating to the clean-up procedure.

Our findings are as follows:
An estimated 300 pounds of U_8 (black oxide) dust was left uncleaned deposited on catch basin floor and surrounding machinery. It was not reclaimed until the next day, November 30, 1984 with the following explantion by management, we could not find an extension cord (440 power). When the cord was finally located, it then became obvious that the vacuum hose was too short to reach the spill. Approximately 18 hours elapsed before other methods were implemented.

The above is just another example of mis-management.

Witnesses: Gene Branham, Heavy Equipment Operator
Richard Gibson, Heavy Equipment Operator
Leland Russell, Rigger
Mike Playforth, Millwright
Dave Fitch, Millwright

FERNALD ATOMIC TRADES & LABOR COUNCIL
Affiliated with The A. F. of L. - C. I. O.

April 2, 1985

On 02-21-85, Health and Safety Technician, Mr. R. Gill, entered Plant 8 for the purpose of monitoring Dust Collector's G43-27 and G43-29. Upon entering the plant, I escorted Mr. Gill to Dust Collector G43-27.

I requested that Mr. Gill monitor the whole interior of the Dust Collector since the operator's would be going inside of the Dust Collector to clean and to run a dye test on both dust collectors. All doors were open on both sides of the Dust Collector.

Mr. Gill monitored Bag 1,2,3,4 and 7. He then proceeded to fill out his entry permit. I asked if he was going to monitor the opposite side. He said , "I have already done that". I said, "Mr. Gill I was standing right here with you and have been watching you; you have yet to monitor the other side." I then asked, "Mr. Gill will you please monitor the other side." He refused to answer me. I again asked him the same question again and he refused to answer me. He filled out the entry permit and went to monitor Dust Collector G43-29. I followed him to G43-29. Mr. Gill monitored the south side of G43-39 but not the north side. I requested that he monitor both sides in the presence of Mr. Jim Satchwill. Mr Satchwill proceeded to open the north side of G43-29 which took a little more than a minute. When Mr. Satchwill was finished, Mr. Gill was gone to the control room. I followed Mr. Gill to the control room. In the presence of my supervisor, I asked my supervisor to ask Mr. Gill why he would not monitor both sides of the Dust Collectors. Mr. Gill would not answer my supervisor. Mr. Gill finished his paper work and left.

I rejected and my area supervisor rejected his readings and requested another technician to re-monitor the Dust Collectors. Before the technician, Mr. Roger Grant, could perform the monitoring, the blow ring on G43-27 was cleaned by Mr. Jim Satchwill and Mr. Earl Sullivan cleaned the blow rings and bag on G43-29/

Mr. Grant proceeded to monitor the Dust Collector in question (both sides) and the resulting figures of his and Mr. Gill's are attached.

James T. Simensen
Union Health Representative

Robert Schwab
Chairman Union Safety Committee

RS/bg

NLO, INC.

WORK PERMIT

Permit No. ④

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 9	AREA: Outside docking	EQUIPMENT: Amerjet Dust Collector

JOB DESCRIPTION: Monitor for Entry

STARTING DATE: 3/15/85	TIME: 4:30	ISSUED TO: LEFEVRE	INITIATED BY: Don Bastin

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed ______ (FOREMAN) Date ______ Time ______

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:
PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☒ Radiation Evaluation Needed.

Respirator Required: ☒ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA		RE-EVALUATION DATA	
EXTERNAL RADIATION (AT WORKING DISTANCE): β + γ 100 mreps/hr. γ ______ mr/hr.		EXTERNAL RADIATION (AT WORKING DISTANCE): β + γ ______ mreps/hr. γ ______ mr/hr.	
RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 3 hours		RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):	
EXPIRATION DATE: 3-15-85	IND. HYGIENE & RADIATION DEPT.:	EXPIRATION DATE:	IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS:

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:	PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

NO.	DISTRIBUTION OF COPIES
1	White – Posted at Location
2	Blue – Fire & Safety (RECORD COPY)
3	Yellow – IH & R (RECORD COPY)

☒ Condition Applicable When Checked.

NLO-HAS-973 (REV. 10/26/65) REPLACES NLO-HAS-392, & NLO-HAS-596

NLO, INC.

WORK PERMIT

Permit No. ____________

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 9
AREA:
EQUIPMENT: AMER JET DUST COLLECT.

JOB DESCRIPTION: PUT BANDS ON BOTTOM OF BARS

STARTING DATE: 3-16-85
TIME: 8:00
ISSUED TO: [illegible]
INITIATED BY: H. Koetter

Work complete, equipment requires testing. ☐ (Signature not required unless checked) ✓

Signed ____________ (FOREMAN) Date ____________ Time ____________

SECTION B

[ ] FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:
FIRE & SAFETY INSPECTOR:

PERMIT EXTENSION:
FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☒ Radiation Evaluation Needed.

Respirator Required: ☐ Airline ☐ Chemical Cartridge Type ☒ Dust Type ☐ None

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):
$\beta + \gamma$ 5 mreps/hr. γ ____________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 60 hours

EXPIRATION DATE: 3-17-85
IND. HYGIENE & RADIATION DEPT.: Roger Grant

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):
$\beta + \gamma$ ____________ mreps/hr. γ ____________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):

EXPIRATION DATE:
IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS: Dust collector has been thoroughly cleaned, no process material has passed through system yet.

SECTION E

[ ] ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:
FIRE & SAFETY INSPECTOR:
PERMIT EXTENSION:
FIRE & SAFETY INSPECTOR:

NO.	DISTRIBUTION OF COPIES
1	White – Posted at Location
2	Blue – Fire & Safety (RECORD COPY)
3	Yellow – IH & R (RECORD COPY)

☒ Condition Applicable When Checked.

NLO-HAS-973 (REV. 10/26/65) REPLACES NLO-HSS-552, & NLO-HSS-556

NLO, INC.

WORK PERMIT

Permit No. ____________

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 9

AREA: SO. OUTSIDE OF 9

EQUIPMENT: AMER JET DUST COLLECTOR

JOB DESCRIPTION: INSTALL BOTTOM RINGS ON BAGS

STARTING DATE: 3-16-85	TIME: 3:00	ISSUED TO:	INITIATED BY: Harvel Roetter

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed ____________ (FOREMAN) Date ____________. Time ____________

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:

FIRE & SAFETY INSPECTOR:

PERMIT EXTENSION:

FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☒ Radiation Evaluation Needed.

Respirator Required: ☐ Airline ☐ Chemical Cartridge Type ☒ Dust Type ☐ None

NORTH SIDE INSIDE COLLECTOR

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ 2 mreps/hr. γ ____________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 150 hours

EXPIRATION DATE: 3-17-85

IND. HYGIENE & RADIATION DEPT.: Roger Grant

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ ____________ mreps/hr. γ ____________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):

EXPIRATION DATE:

IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS: Enclosure has been thoroughly cleaned out, with new bags, no process material has been through the collector.

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:	PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

NO.	DISTRIBUTION OF COPIES
1	White – Posted at Location
2	Blue – Fire & Safety *(RECORD COPY)*
3	Yellow – IH & R *(RECORD COPY)*

☒ Condition Applicable When Checked.

O-HAS-973 (REV. 10/26/65) REPLACES NLO-HAS-352, & NLO-HAS-356

NLO, INC.

WORK PERMIT

Permit No. ____________

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 9

AREA: [illegible] decking

EQUIPMENT: Amerjet Dust Collector

JOB DESCRIPTION: Monitor for Entry

STARTING DATE: 3/15/85

TIME: 4:30

ISSUED TO: LEFEVRE

INITIATED BY: Don Foster

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed ____________ (FOREMAN) Date ____________ Time ____________

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:

FIRE & SAFETY INSPECTOR:

PERMIT EXTENSION:

FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☒ Radiation Evaluation Needed.

Respirator Required: ☒ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β+γ 100 mreps/hr. γ ____________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 3 hours

EXPIRATION DATE: 3-15-85

IND. HYGIENE & RADIATION DEPT.

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β+γ ____________ mreps/hr. γ ____________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):

EXPIRATION DATE:

IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS:

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:

FIRE & SAFETY INSPECTOR:

PERMIT EXTENSION:

FIRE & SAFETY INSPECTOR:

NO.	DISTRIBUTION OF COPIES
1	White – Posted at Location
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3	Yellow – IH & R *(RECORD COPY)*

☒ Condition Applicable When Checked.

NLO-HAS-973 (REV. 10/26/69) REPLACES NLO-HAS-392, & NLO-HAS-396

NLO, INC.

WORK PERMIT

Permit No. ____________

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 9	AREA:	EQUIPMENT: AMER JET DUST COLLECTOR

JOB DESCRIPTION: PUT BANDS ON BOTTOM OF BAGS

STARTING DATE: 3-16-85	TIME: 8:00	ISSUED TO: [illegible]	INITIATED BY: H. Keetter

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed ____________ (FOREMAN) Date ____________ Time ____________

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:
PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☒ Radiation Evaluation Needed.

Respirator Required: ☐ Airline ☐ Chemical Cartridge Type ☒ Dust Type ☐ None

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ 5 mreps/hr. γ ____ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 60 hours

EXPIRATION DATE: 3-17-85	IND. HYGIENE & RADIATION DEPT. Roger Grant

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ ____ mreps/hr. γ ____ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):

EXPIRATION DATE:	IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS: Dust collector has been thoroughly cleaned, no process material has passed through system yet.

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:	PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

NO.	DISTRIBUTION OF COPIES
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☒ Condition Applicable When Checked.

NLO-HES-973 (REV. 10/26/69) REPLACES NLO-HES-352, & NLO-HES-556

NLO, INC.

WORK PERMIT

Permit No. ____________

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 9

AREA: SO. OUTSIDE OF 9

EQUIPMENT: AMER JET DUST COLLECTOR

JOB DESCRIPTION: INSTALL BOTTOM RINGS ON BAGS

STARTING DATE: 3-16-85

TIME: 3:00

ISSUED TO:

INITIATED BY: Harold Roetter

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed ____________ (FOREMAN) Date ____________ Time ____________

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:

FIRE & SAFETY INSPECTOR:

PERMIT EXTENSION:

FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☒ Radiation Evaluation Needed.

Respirator Required: ☐ Airline ☐ Chemical Cartridge Type ☒ Dust Type ☐ None

NORTH SIDE INSIDE COLLECTOR

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ 2 mreps/hr. γ ____________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 150 hours

EXPIRATION DATE: 3.17.85

IND. HYGIENE & RADIATION DEPT.: Roger Grant

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ ____________ mreps/hr. γ ____________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):

EXPIRATION DATE:

IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS:

Enclosure has been thoroughly cleaned out, with new bags, no process material has been through the collector.

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:

FIRE & SAFETY INSPECTOR:

PERMIT EXTENSION:

FIRE & SAFETY INSPECTOR:

NO.	DISTRIBUTION OF COPIES
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☒ Condition Applicable When Checked.

0-HAS-973 (REV. 10/26/65) REPLACES NLO-HAS-352, & NLO-HAS-356

NLO, INC.

WORK PERMIT

Permit No. ____________

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 5	AREA: 2	EQUIPMENT: 248 Hoffman

JOB DESCRIPTION:
replace bags
+ weld a stand pipe

STARTING DATE: 3-14-85	TIME: 2 00 pm	ISSUED TO: Millwright + Mueller	INITIATED BY: C. Mueller

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed ____________ (FOREMAN) Date ____________ Time ____________

SECTION B

☒ FLAME & WELDING PERMIT

☒ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:
Explosimeter negative at 2:25pm

PERMIT EXPIRES: 3/14/85	FIRE & SAFETY INSPECTOR: B Jones
PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☒ Radiation Evaluation Needed.

Respirator Required: ☒ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA		RE-EVALUATION DATA	
EXTERNAL RADIATION (AT WORKING DISTANCE): β+ γ 5.0 mreps/hr. γ ______ mr/hr.		EXTERNAL RADIATION (AT WORKING DISTANCE): β+ γ ______ mreps/hr. γ ______ mr/hr.	
RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 60 hrs.		RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):	
EXPIRATION DATE: 3-14-85	IND. HYGIENE & RADIATION DEPT. D Grant	EXPIRATION DATE:	IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS:

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:	PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

NO.	DISTRIBUTION OF COPIES
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☒ Condition Applicable When Checked.

NLO-HSS-973 (REV. 10/26/65) REPLACES NLO-HSS-352, & NLO-HSS-356

NLO, INC.

WORK PERMIT

Permit No. ____________

NOTE: For instructions and Sugg[illegible] see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 5	AREA: Reduction	EQUIPMENT: 248 Hoffman

JOB DESCRIPTION: Clean

STARTING DATE: 3-14-85	TIME: 0100	ISSUED TO: Munsie	INITIATED BY: K.J. Peters

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed ____________ (FOREMAN) Date ____________ Time ____________

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:
PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☑ Radiation Evaluation Needed.

Respirator Required: ☑ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β+γ 50 mreps/hr. γ ____________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 6 HOURS

EXPIRATION DATE: 3-14-85	IND. HYGIENE & RADIATION DEPT. A. HOLSTEIN

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β+γ ____________ mreps/hr. γ ____________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):

EXPIRATION DATE:	IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS:

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:	PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

NO.	DISTRIBUTION OF COPIES
1	White – Posted at Location
2	Blue – Fire & Safety *(RECORD COPY)*
3	Yellow – IH & R *(RECORD COPY)*

☒ Condition Applicable When Checked.

NLO-HAS-973 (REV. 10/26/65) REPLACES NLO-HAS-352, & NLO-HAS-356

NLO, INC.

WORK PERMIT

Permit No. __________

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 5	AREA: 2	EQUIPMENT: 248 Hoffman

JOB DESCRIPTION: replace bag + weld stand pipe

STARTING DATE: 3-14-85	TIME: 8 30 am	ISSUED TO: Welder + Millwrights	INITIATED BY: C. Mueller

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed __________ (FOREMAN) Date __________ Time __________

SECTION B

☒ FLAME & WELDING PERMIT

☒ Suggested Check Points Followed.

SPECIAL PRECAUTIONS: One Man For Fire Watch
Check Area After Work is
Done

PERMIT EXPIRES: 3/14/85	FIRE & SAFETY INSPECTOR:
PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS: Lock & Tag As Needed.

INDUSTRIAL HYGIENE – SECTION D

☒ Radiation Evaluation Needed.

Respirator Required: ☒ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ 15 mreps/hr. γ __________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 20 hrs

EXPIRATION DATE: 3-14-85	IND. HYGIENE & RADIATION DEPT. D. Grant

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ __________ mreps/hr. γ __________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):

EXPIRATION DATE:	IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS:

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:	PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

NO.	DISTRIBUTION OF COPIES
1	White – Posted at Location
2	Blue – Fire & Safety *(RECORD COPY)*
3	Yellow – IH & R *(RECORD COPY)*

☒ Condition Applicable When Checked.

NLO-MGS-973 (REV. 10/26/65) REPLACES NLO-MGS-352, & NLO-MGS-356

NLO, INC.

WORK PERMIT

Permit No. ____________

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 4	AREA: 4th Floor	EQUIPMENT: G9-7 Dust Collector

JOB DESCRIPTION: Entry Permit to Change Bags.

STARTING DATE: 1/14/84	TIME: 11:00	ISSUED TO:	INITIATED BY:

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed ____________ (FOREMAN) Date ____________ Time ____________

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:
PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☒ Radiation Evaluation Needed.

Respirator Required: ☒ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ 5 mR. mreps/hr. γ ____________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 160 HRS.

EXPIRATION DATE: 1/14/84	IND. HYGIENE & RADIATION DEPT. J Johnston

SPECIAL PRECAUTIONS:

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ ____________ mreps/hr. γ ____________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):

EXPIRATION DATE:	IND. HYGIENE & RADIATION DEPT.:

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:	PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

NO.	DISTRIBUTION OF COPIES
1	White – Posted at Location
2	Blue – Fire & Safety *(RECORD COPY)*
3	Yellow – IH & R *(RECORD COPY)*

☒ Condition Applicable When Checked.

NLO-HSS-973 (REV. 10/26/65) REPLACES NLO-HSS-352, & NLO-HSS-356

NLO, INC.

WORK PERMIT

Permit No. __________

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 4	AREA: 4th fl North	EQUIPMENT: G4-7 D/C.

JOB DESCRIPTION: Overhaul & rebag G4-7 Dust Collector

STARTING DATE: 01 14 84	TIME: 0830	ISSUED TO: Maint. MARKSB	JM

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed __________ (FOREMAN) Date __________ Time __________

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:
PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☑ Radiation Evaluation Needed.

Respirator Required: ☑ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ 5 mR mreps/hr. γ __________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 60 Hrs

EXPIRATION DATE:	IND. HYGIENE & RADIATION DEPT.

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ __________ mreps/hr. γ __________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):

EXPIRATION DATE:	IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS:

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:	PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

NO.	DISTRIBUTION OF COPIES
1	White – Posted at Location
2	Blue – Fire & Safety (RECORD COPY)
3	Yellow – IH & R (RECORD COPY)

☒ Condition Applicable When Checked.

NLO-HAS-973 (REV. 10/26/65) REPLACES NLO-HAS-352, & NLO-HAS-556

NLO, INC.

WORK PERMIT

Permit No. ______

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: PLT. 4

AREA: 4TH FLOOR

EQUIPMENT: G 4-7 DUST COLLECTOR

JOB DESCRIPTION: REBAG DUST COLLECTOR

STARTING DATE: 11/12/83

TIME: 8:45 AM

ISSUED TO: LEE COLLETT, JOHN MARKSBERRY

INITIATED BY:

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed ______ (FOREMAN) Date ______ Time ______

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:

FIRE & SAFETY INSPECTOR:

PERMIT EXTENSION:

FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☑ Radiation Evaluation Needed.

Respirator Required: ☑ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ 35 mreps/hr. γ ______ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 8.5 HRS

EXPIRATION DATE: 11-12-83

IND. HYGIENE & RADIATION DEPT. Tom Bayer

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ ______ mreps/hr. γ ______ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):

EXPIRATION DATE:

IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS:

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:

FIRE & SAFETY INSPECTOR:

PERMIT EXTENSION:

FIRE & SAFETY INSPECTOR:

NO.	DISTRIBUTION OF COPIES
1	White – Posted at Location
2	Blue – Fire & Safety *(RECORD COPY)*
3	Yellow – IH & R *(RECORD COPY)*

☒ Condition Applicable When Checked.

NLO-HAS-973 (REV. 10/26/65) REPLACES NLO-HAS-352, & NLO-HAS-556

NLO, INC.

WORK PERMIT

Permit No.____________

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: [illegible]	AREA: [illegible]	EQUIPMENT: [illegible]

JOB DESCRIPTION: [illegible]

STARTING DATE: 1-6-[illegible]	TIME: [illegible]	ISSUED TO: [illegible]	INITIATED BY: [illegible]

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed __________ (FOREMAN) Date__________ Time __________

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:
PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☐ Radiation Evaluation Needed.

Respirator Required: ☒ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ 1 mreps/hr. γ ________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): [illegible]

EXPIRATION DATE: [illegible]	IND. HYGIENE & RADIATION DEPT. [illegible]

SPECIAL PRECAUTIONS:

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ ________ mreps/hr. γ ________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):

EXPIRATION DATE:	IND. HYGIENE & RADIATION DEPT.

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:	PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

NO.	DISTRIBUTION OF COPIES
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☒ Condition Applicable When Checked.

NLO-H&S-973 (REV. 10/26/65) REPLACES NLO-H&S-352, & NLO-H&S-356

NLO, INC.

WORK PERMIT

Permit No. ________

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 5	AREA: 2	EQUIPMENT: 1-1 Dust Collector

JOB DESCRIPTION: Clean enclosure

STARTING DATE: 1-8-83	TIME: 8:15 AM.	ISSUED TO: Ron Karr-Billie Black	INITIATED BY: [illegible]

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed ________ (FOREMAN) Date ________ Time ________

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:
PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☐ Radiation Evaluation Needed.

Respirator Required: ☐ Airline ☐ Chemical Cartridge Type ☑ Dust Type ☐ None

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ ________ mreps/hr. γ ________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):

EXPIRATION DATE:	IND. HYGIENE & RADIATION DEPT.: [illegible]

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ ________ mreps/hr. γ ________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):

EXPIRATION DATE:	IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS: [illegible]

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:	PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

NO.	DISTRIBUTION OF COPIES
1	White – Posted at Location
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☒ Condition Applicable When Checked.

NLO-H&S-973 (REV. 10/26/65) REPLACES NLO-H&S-392, & NLO-H&S-398

NLO, INC.

WORK PERMIT

Permit No. ____

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION - SECTION A

BUILDING: 5

AREA: 2

EQUIPMENT: No. 5 F Machine

JOB DESCRIPTION: Repair limit switch at blender dump chute

STARTING DATE: 10-25-82

TIME: 10:45 AM

ISSUED TO: M. Harrison & J Burggraham

INITIATED BY:

4hr.

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed ____ (FOREMAN) Date ____ Time ____

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:

FIRE & SAFETY INSPECTOR:

PERMIT EXTENSION:

FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE - SECTION D

☑ Radiation Evaluation Needed.

Respirator Required: ☑ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β+γ 15 mreps/hr. γ ____ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 20 hours

EXPIRATION DATE: 10-25-82

IND. HYGIENE & RADIATION DEPT.: B. L. Arnold

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β+γ ____ mreps/hr. γ ____ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):

EXPIRATION DATE:

IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS:

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:

FIRE & SAFETY INSPECTOR:

PERMIT EXTENSION:

FIRE & SAFETY INSPECTOR:

NO.	DISTRIBUTION OF COPIES
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☒ Condition Applicable When Checked.

NLO-NGS-973 (REV. 10/26/65) REPLACES NLO-NGS-352, & NLO-NGS-356

NLO, INC.

WORK PERMIT

Permit No. ____________

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 5	AREA: 2	EQUIPMENT: No. 5 F. Machine (upper level)

JOB DESCRIPTION: Checkout + repair as necessary

STARTING DATE: 10-25-82	TIME: 8^{15} AM	ISSUED TO: R. Viebrock, C. Crosby + Piggott	INITIATED BY:

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed ______________ (FOREMAN) Date ______________ Time ______________

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:
PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☑ Radiation Evaluation Needed.

Respirator Required: ☑ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA		RE-EVALUATION DATA	
EXTERNAL RADIATION (AT WORKING DISTANCE): β+γ 10 mreps/hr. γ ______ mr/hr.		EXTERNAL RADIATION (AT WORKING DISTANCE): β+γ ______ mreps/hr. γ ______ mr/hr.	
RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 30 HR		RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):	
EXPIRATION DATE: 10-25-82	IND. HYGIENE & RADIATION DEPT. Tom Boyer	EXPIRATION DATE:	IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS:

Removed at 10^{00} AM.
10-25-82

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:	PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

NO.	DISTRIBUTION OF COPIES
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☒ Condition Applicable When Checked.

NLO-HAS-973 (REV. 10/26/65) REPLACES NLO-HAS-352, & NLO-HAS-356

NLO, INC.

WORK PERMIT

Permit No.__________

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 5

AREA: 2

EQUIPMENT: No. 5 "F" Machine

JOB DESCRIPTION: Repair blender valve

STARTING DATE: 3-29-82

TIME: 1:40 PM

ISSUED TO: Maintenance C. Mueller + K Eifert

INITIATED BY:

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed__________ (FOREMAN) Date__________ Time__________

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:

FIRE & SAFETY INSPECTOR:

PERMIT EXTENSION:

FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☐ Radiation Evaluation Needed.

Respirator Required: ☒ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ 100 mreps/hr. γ 15 mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 3 hrs

EXPIRATION DATE: 3-29-82

IND. HYGIENE & RADIATION DEPT. CJ Meyer

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ __________ mreps/hr. γ __________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):

EXPIRATION DATE:

IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS:

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:

FIRE & SAFETY INSPECTOR:

PERMIT EXTENSION:

FIRE & SAFETY INSPECTOR:

NO.	DISTRIBUTION OF COPIES
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☒ Condition Applicable When Checked.

NLO-H65-973 (REV. 10/26/65) REPLACES NLO-H65-392, & NLO-H65-396

NLO, INC.

WORK PERMIT

Permit No. ______

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 5	AREA: 2	EQUIPMENT: N: 5 F Machine

JOB DESCRIPTION: Replace blender gasket

STARTING DATE: 9-3-82	TIME: 8^{45} AM	ISSUED TO: C Muller & C Crosby	INITIATED BY: [illegible]

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed ______ (FOREMAN) Date ______ Time ______

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:
PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☑ Radiation Evaluation Needed.

Respirator Required: ☑ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

$\beta + \gamma$ 20 mreps/hr. γ ______ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 15 HR

EXPIRATION DATE: 9-3-82	IND. HYGIENE & RADIATION DEPT.: Tom Bayer

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

$\beta + \gamma$ ______ mreps/hr γ ______ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):

EXPIRATION DATE:	IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS:

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:	PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

NO.	DISTRIBUTION OF COPIES
1	White – Posted at Location
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3	Yellow – IH & R (RECORD COPY)

☒ Condition Applicable When Checked.

NLO-H&S-973 (REV. 10/26/65) REPLACES NLO-H&S-352, & NLO-H&S-356

NLO, INC.

WORK PERMIT

Permit No. ____________

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: PLT #5	AREA: A	EQUIPMENT: #5 F MACHINE

JOB DESCRIPTION: Repair BLender VALve

STARTING DATE: 10-26-81	TIME: 2:00	ISSUED TO: G. MOORE	INITIATED BY: R. Ferris

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed ____________ (FOREMAN) Date 10-26-81 Time 2:00 3:45

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:
PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☐ Radiation Evaluation Needed.

Respirator Required: ☑ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):
β + γ 10 mreps/hr. γ — mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 30 hrs.

EXPIRATION DATE: 10-26-81	IND. HYGIENE & RADIATION DEPT. G-Stevens

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):
β + γ ____________ mreps/hr. γ ____________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):

EXPIRATION DATE:	IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS:

3 hrs limit [illegible]

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:	PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

NO.	DISTRIBUTION OF COPIES
1	White – Posted at Location
2	Blue – Fire & Safety (RECORD COPY)
3	Yellow – IH & R (RECORD COPY)

☒ Condition Applicable When Checked.

NLO-HSS-973 (REV. 10/26/65) REPLACES NLO-HSS-332, & NLO-HSS-556

NLO, INC.

WORK PERMIT

Permit No. ________

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 5	AREA: 2	EQUIPMENT: No. 5 F Machine

JOB DESCRIPTION: Repair tamping chute

STARTING DATE: 11-7-84	TIME: 10⁴⁵ AM	ISSUED TO: C. Mueller – L. Mirich	INITIATED BY:

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed ________ (FOREMAN) Date ________ Time ________

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES: | FIRE & SAFETY INSPECTOR:

PERMIT EXTENSION: | FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☑ Radiation Evaluation Needed.

Respirator Required: ☑ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA	RE-EVALUATION DATA
EXTERNAL RADIATION (AT WORKING DISTANCE): β + γ 75 mreps/hr. γ ____ mr/hr.	EXTERNAL RADIATION (AT WORKING DISTANCE): β + γ ____ mreps/hr. γ ____ mr/hr.
RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 4 HOURS	RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):
EXPIRATION DATE: 10-07-84 | IND. HYGIENE & RADIATION DEPT.: A. HOLSTEIN	EXPIRATION DATE: | IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS:

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:	PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

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☒ Condition Applicable When Checked.

NLO-M&S-973 (REV. 10/26/69) REPLACES NLO-M&S-332, & NLO-M&S-996

NLO, INC.

WORK PERMIT

Permit No. ____________

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 5	AREA: 2	EQUIPMENT: No. 5 F Machine

JOB DESCRIPTION: Repair tamping chute

STARTING DATE: 11-6-84	TIME: 11:15	ISSUED TO: C. Mueller & L. Mirick	INITIATED BY:

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed ____________ (FOREMAN) Date ____________ Time ____________

SECTION B	SECTION C
☐ FLAME & WELDING PERMIT	☐ CORROSIVE MATERIAL
☐ Suggested Check Points Followed.	☐ Acid ☐ Caustic ☐ Solvent
SPECIAL PRECAUTIONS:	☐ Suggested Check Points Followed.
	SPECIAL PRECAUTIONS:
PERMIT EXPIRES: FIRE & SAFETY INSPECTOR:	
PERMIT EXTENSION: FIRE & SAFETY INSPECTOR:	

INDUSTRIAL HYGIENE – SECTION D

☑ Radiation Evaluation Needed.

Respirator Required: ☑ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA		RE-EVALUATION DATA	
EXTERNAL RADIATION (AT WORKING DISTANCE): $\beta+\gamma$ 35 mreps/hr. γ ____ mr/hr.		EXTERNAL RADIATION (AT WORKING DISTANCE): $\beta+\gamma$ ____ mreps/hr. γ ____ mr/hr.	
RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 8.5 HOURS		RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):	
EXPIRATION DATE: 11-20-84	IND. HYGIENE & RADIATION DEPT. A. Holstein	EXPIRATION DATE:	IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS:

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:	PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

NO.	DISTRIBUTION OF COPIES
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☒ Condition Applicable When Checked.

NLO-HAS-973 (REV. 10/26/65) REPLACES NLO-HAS-352, & NLO-HAS-356

NLO, INC.

WORK PERMIT

Permit No.__________

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: PT 5

AREA: "F" MACHINE

EQUIPMENT:

JOB DESCRIPTION: REMOVE + REPLACE BLENDER ARMS

STARTING DATE: 8-2-84

TIME: 17:15

ISSUED TO: BRENNER

INITIATED BY: PUCKE

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed__________ (FOREMAN) Date__________ Time__________

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:

FIRE & SAFETY INSPECTOR:

PERMIT EXTENSION:

FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☒ Radiation Evaluation Needed.

Respirator Required: ☑ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β+ γ 30 mreps/hr. γ ________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 10 HRS.

EXPIRATION DATE: 8-2-84

IND. HYGIENE & RADIATION DEPT. A. HOLSTEIN

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β+ γ ________ mreps/hr. γ ________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):

EXPIRATION DATE:

IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS:

SECTION E

☒ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:

FIRE & SAFETY INSPECTOR:

PERMIT EXTENSION:

FIRE & SAFETY INSPECTOR:

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☒ Condition Applicable When Checked.

NLO-HSS-973 (REV. 10/26/65) REPLACES NLO-HSS-352, & NLO-HSS-556

NLO, INC.

WORK PERMIT

Permit No. ____________

NOTE: For Instructions and Suggested Check Points see revers .

GENERAL INFORMATION – SECTION A

BUILDING: 5

AREA: Reduction

EQUIPMENT: 4 F Machine

JOB DESCRIPTION: Replace tamping arms

STARTING DATE: 8/2/84

TIME: 9:00

ISSUED TO: Millwright + Welder

INITIATED BY: C.W. Batchelor

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed ____________ (FOREMAN) Date ____________ Time ____________

SECTION B

☒ FLAME & WELDING PERMIT

☒ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:
Explosimeter Negative 0900
Have man stand-by with extinguisher
as watch

PERMIT EXPIRES: 8/2/84

FIRE & SAFETY INSPECTOR: J. Meddaugh

PERMIT EXTENSION:

FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☑ Radiation Evaluation Needed.

Respirator Required: ☑ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):
β + γ 100 mreps/hr. γ ____________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 3 hours

EXPIRATION DATE: 8-2-84

IND. HYGIENE & RADIATION DEPT.:

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):
β + γ ____________ mreps/hr. γ ____________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):

EXPIRATION DATE:

IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS:

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:

FIRE & SAFETY INSPECTOR:

PERMIT EXTENSION:

FIRE & SAFETY INSPECTOR:

NO.	DISTRIBUTION OF COPIES
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3	Yellow – IH & R (RECORD COPY)

☒ Condition Applicable When Checked.

NLO-H&S-973 (REV. 10/26/65) REPLACES NLO-H&S-392, & NLO-H&S-556

WITH RESPECT TO SUBJECT TIME AND EVENT, THE FOLLOWING ARE THE CIRCUMSTANCES AS I RECALL:

BILL WILSON AND MYSELF PREPARED TO WORK ON SUBJECT DUST COLLECTOR. THE H+S or (F+S) PERSONNEL WAS REQUESTED TO MONITOR SAME PER S.O.P., ARRIVED TO DO SO, AND SHORTLY THEREAFTER LEFT THE JOB SITE. MR WILSON AND I ENTERED THE ENCLOSURE AND PROCEEDED TO WORK UNDER THE PRETENSE THE ENCLOSURE HAD BEEN PROPERLY MONITORED SINCE THE PAPER WORK HAD BEEN FILLED OUT*, UN-BEKNOWING THAT MONITORING HAD NOT BEEN SATISFACTORILY COMPLETED UNTIL THE SAFETY PERSONNEL RETURNED A SECOND TIME AND TOLD US HE COULD NOT PROPERLY MONITOR THE EQUIPMENT DUE TO THE FACT HE DID NOT HAVE THE SPECIFIC "COUNTER" HE NEEDED. THE H+S (F+S) PERSONNEL REQUESTED OR PREFERRED THAT WE STOP WORKING ON THE EQUIPMENT UNTIL HE OBTAINED NECESSARY EQUIPMENT TO PROPERLY MONITOR OR FOUND OUT HOW TO EVALUATE THE DUST COLLECTOR. WE IMMEDIATELY COMPLIED WITH HIS REQUEST AND NOTIFIED OUR SUPERVISOR OF SAME AS WELL AS INFORMED PRODUCTION OF SAME, LEAVING THE JOB INCOMPLETE.

RESPECTFULLY SUBMITTED,

Robert G. Lator

* APPARENTLY INCOMPLETE AT THAT TIME

NLO, INC.

WORK PERMIT

Permit No. ______

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 5	AREA: 2	EQUIPMENT: 251 Hoffman Dust Colle

JOB DESCRIPTION: Rehang one bag.

STARTING DATE: 4-1-82	TIME: 8^{30} AM	ISSUED TO: Maintenance Millwrights	INITIATED BY:

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed ______ (FOREMAN) Date ______ Time ______

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:
PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☐ Radiation Evaluation Needed.

Respirator Required: ☒ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ 50 mreps/hr. γ – mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 6 hrs

EXPIRATION DATE: 4-1-82	IND. HYGIENE & RADIATION DEPT. C J Mye

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ ______ mreps/hr. γ ______ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):

EXPIRATION DATE:	IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS:

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:	PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

NO.	DISTRIBUTION OF COPIES
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☒ Condition Applicable When Checked.

NLO-H&S-973 (REV. 10/26/65) REPLACES NLO-H&S-352, & NLO-H&S-556

NLO, INC.

WORK PERMIT

Permit No.

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 5

AREA: 2

EQUIPMENT: 254 Dust Collector

JOB DESCRIPTION: Riplace 2 bags.

STARTING DATE: 4-1-82

TIME: 8^{30} A.M.

ISSUED TO: Maintenance Millwrights

INITIATED BY:

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed (FOREMAN) Date Time

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:

FIRE & SAFETY INSPECTOR:

PERMIT EXTENSION:

FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☐ Radiation Evaluation Needed.

Respirator Required: ☒ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ 30 mreps/hr. γ — mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 10 hrs

EXPIRATION DATE: 4-1-82

IND. HYGIENE & RADIATION DEPT. CJ Mez

SPECIAL PRECAUTIONS:

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ mreps/hr. γ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):

EXPIRATION DATE:

IND. HYGIENE & RADIATION DEPT.:

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:

FIRE & SAFETY INSPECTOR:

PERMIT EXTENSION:

FIRE & SAFETY INSPECTOR:

NO.	DISTRIBUTION OF COPIES
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☒ Condition Applicable When Checked.

NLO-HAS-973 (REV. 10/26/69) REPLACES NLO-HAS-352, & NLO-HAS-556

NLO, INC.

WORK PERMIT

Permit No.

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 5

AREA: 2

EQUIPMENT: Lid - No. 3 Remelt fce

JOB DESCRIPTION: Leak check lid.

STARTING DATE: 1-12-84

TIME: 9⁰⁰ AM

ISSUED TO: A. Roberts

INITIATED BY:

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed (FOREMAN)

Date

Time

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:

FIRE & SAFETY INSPECTOR:

PERMIT EXTENSION:

FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☐ Radiation Evaluation Needed.

Respirator Required: ☐ Airline ☐ Chemical Cartridge Type ☑ Dust Type ☐ None

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β+γ 40 MR mreps/hr. γ m/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 7.5 HRs

EXPIRATION DATE: 1/12/84

IND. HYGIENE & RADIATION DEPT.: RLG'11

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β+γ 1800 mreps/hr. γ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 0.16 HRs

EXPIRATION DATE: 1/12/84

IND. HYGIENE & RADIATION DEPT.: RLG'11

SPECIAL PRECAUTIONS: Place Rubber mat over Area

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:

FIRE & SAFETY INSPECTOR:

PERMIT EXTENSION:

FIRE & SAFETY INSPECTOR:

NO.	DISTRIBUTION OF COPIES
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☒ Condition Applicable When Checked.

NLO-HAS-973 (REV. 10/26/65) REPLACES NLO-HAS-352, & NLO-HAS-356

NLO, INC.

WORK PERMIT

Permit No.

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 5	AREA: Remelt	EQUIPMENT: 3 & 4 Remelt enclosure

JOB DESCRIPTION: Pressure check # 3 furnace Dist.

STARTING DATE: 1-12-84	TIME: 11:05	ISSUED TO: Pipefitter	INITIATED BY: C.W. Belcher

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed (FOREMAN) Date Time

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES: FIRE & SAFETY INSPECTOR:

PERMIT EXTENSION: FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☐ Radiation Evaluation Needed.

Respirator Required: ☐ Airline ☐ Chemical Cartridge Type ☑ Dust Type ☐ None

EVALUATION DATA		RE-EVALUATION DATA	
EXTERNAL RADIATION (AT WORKING DISTANCE): β+γ 1800 mreps/hr. γ mr/hr.		EXTERNAL RADIATION (AT WORKING DISTANCE): β+γ mreps/hr. γ mr/hr.	
RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 0/16HRS		RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):	
EXPIRATION DATE: 1/12/84	IND. HYGIENE & RADIATION DEPT.	EXPIRATION DATE:	IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS:

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:	PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

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☒ Condition Applicable When Checked.

NLO-HAS-973 (REV. 10/26/65) REPLACES NLO-HAS-392, & NLO-HAS-996

N.L. INC.

WORK PERMIT

Permit No.__________

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 5	AREA: Reduction	EQUIPMENT: Rockwell

JOB DESCRIPTION: Replace elements

STARTING DATE: 6-1-84	TIME: 12:30	ISSUED TO: Electrician	INITIATED BY: C.D. Batchelor

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed__________ (FOREMAN) Date__________ Time__________

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:
PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☐ Radiation Evaluation Needed.

Respirator Required: ☑ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ 3.0 mreps/hr. γ __________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 100 HRs

EXPIRATION DATE: 6/1/84	IND. HYGIENE & RADIATION DEPT. RLG

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ __________ mreps/hr. γ __________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK).

EXPIRATION DATE:	IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS:

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:	PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

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☒ Condition Applicable When Checked.

NLO-H&S-973 (REV. 10/26/65) REPLACES NLO-H&S-352, & NLO-H&S-556

NLO, INC.

WORK PERMIT

Permit No. __________

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 5	AREA: Reduction	EQUIPMENT: Rockwell

JOB DESCRIPTION: Replace elements

STARTING DATE: 6/1/84	TIME: 15:40	ISSUED TO: Electrician	INITIATED BY: C.W. Babbeler

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed __________ (FOREMAN) Date __________ Time __________

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:
PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☑ Radiation Evaluation Needed.

Respirator Required: ☑ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA		RE-EVALUATION DATA	
EXTERNAL RADIATION (AT WORKING DISTANCE): $\beta + \gamma$ 15 mreps/hr. γ ____ mr/hr.		EXTERNAL RADIATION (AT WORKING DISTANCE): $\beta + \gamma$ ____ mreps/hr. γ ____ mr/hr.	
RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 20 hours		RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):	
EXPIRATION DATE: 6-1-84	IND. HYGIENE & RADIATION DEPT. D. Arnold	EXPIRATION DATE:	IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS:

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:	PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

NO.	DISTRIBUTION OF COPIES
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☒ Condition Applicable When Checked.

NLO-H&S-973 (REV. 10/26/65) REPLACES NLO-H&S-352, & NLO-H&S-556

NLO, INC.

WORK PERMIT

Permit No. ______________

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING:	AREA:	EQUIPMENT:
5	Reduction	Rockwell

JOB DESCRIPTION: Replace elements

STARTING DATE:	TIME:	ISSUED TO:	INITIATED BY:
8/6/84	15:40	Electrician	

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed ______________ (FOREMAN) Date ______________ Time ______________

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:
PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☑ Radiation Evaluation Needed.

Respirator Required: ☑ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ 40 mreps/hr. γ ______ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 7 HRS. 30 MIN.

EXPIRATION DATE:	IND. HYGIENE & RADIATION DEPT.
8-6-84	A. HOLSTEIN

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ ______ mreps/hr. γ ______ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):

EXPIRATION DATE:	IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS:

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:	PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

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☒ Condition Applicable When Checked.

NLO-HSS-973 (REV. 10/26/65) REPLACES NLO-HSS-392, & NLO-HSS-396

NLO, INC

WORK PERMIT

Permit No.

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION SECTION A

BUILDING: 5

AREA: Reduction

EQUIPMENT: #5 Rockwell

JOB DESCRIPTION: Replace elements

STARTING DATE: 8/6/84

TIME: 15:45

ISSUED TO: Electrician

INITIATED BY: C.D. Batchelor

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed ______ (FOREMAN) Date ______ Time ______

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:

FIRE & SAFETY INSPECTOR:

PERMIT EXTENSION:

FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☑ Radiation Evaluation Needed.

Respirator Required: ☑ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ 30 mreps/hr. γ ______ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 10 HRS.

EXPIRATION DATE: 8-6-84

IND. HYGIENE & RADIATION DEPT. A. HOLSTEIN

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ ______ mreps/hr. γ ______ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):

EXPIRATION DATE:

IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS:

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:

FIRE & SAFETY INSPECTOR:

PERMIT EXTENSION:

FIRE & SAFETY INSPECTOR:

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☒ Condition Applicable When Checked.

NLO-HSS-973 (REV. 10/26/69) REPLACES NLO-HSS-392, & NLO-HSS-556

NLO, INC.

WORK PERMIT

Permit No. ____________

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 5

AREA: Reduct'n

EQUIPMENT: #6 Rockwell

JOB DESCRIPTION: Replace elements

STARTING DATE: 8/6/84

TIME: 15:45

ISSUED TO: Electrician

INITIATED BY: C.D.

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed ____________ (FOREMAN) Date ____________ Time ____________

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:

FIRE & SAFETY INSPECTOR:

PERMIT EXTENSION:

FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☑ Radiation Evaluation Needed.

Respirator Required: ☑ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β+γ 25 mreps/hr. γ ____________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 12 HRS.

EXPIRATION DATE: 8-6-84

IND. HYGIENE & RADIATION DEPT. A. HEKSTEIN

SPECIAL PRECAUTIONS:

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β+γ ____________ mreps/hr. γ ____________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):

EXPIRATION DATE:

IND. HYGIENE & RADIATION DEPT.:

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:

FIRE & SAFETY INSPECTOR:

PERMIT EXTENSION:

FIRE & SAFETY INSPECTOR:

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NLO-M&S-973 (REV. 10/26/65) REPLACES NLO-M&S-352, & NLO-M&S-556

NLO, INC.

WORK PERMIT

Permit No. ____________

NOTE: For Instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 5	AREA: 2	EQUIPMENT: East Burnout and elec. Platf.

JOB DESCRIPTION: Wire in New Burners.

STARTING DATE: 8-8-84	TIME: 9 30 AM	ASSIGNED TO: J Burgschann + J Bell	INITIATED BY:

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed ____________ (FOREMAN) Date ____________ Time ____________

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:
PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☑ Radiation Evaluation Needed.

Respirator Required: ☑ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ 500 mreps/hr. γ ____________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK): 36 mins. – BACK

EXPIRATION DATE: 8-8-84	IND. HYGIENE & RADIATION DEPT. A. Holstein

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):

β + γ ____________ mreps/hr. γ ____________ mr/hr.

RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):

EXPIRATION DATE:	IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS:

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:	FIRE & SAFETY INSPECTOR:	PERMIT EXTENSION:	FIRE & SAFETY INSPECTOR:

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☒ Condition Applicable When Checked.

NLO-H&S-973 (REV. 10/26/65) REPLACES NLO-H&S-352, & NLO-H&S-556

NLO, INC.

WORK PERMIT

Permit No. ____________

NOTE: For instructions and Suggested Check Points see reverse side.

GENERAL INFORMATION – SECTION A

BUILDING: 5
AREA: 2
EQUIPMENT: East Burnout
JOB DESCRIPTION: Wire in New Burners

STARTING DATE: 8-8-84
TIME: 8^{30} AM
ISSUED BY: J. Burggraham + J. Bell
INITIATED BY:

Work complete, equipment requires testing. ☐ (Signature not required unless checked)

Signed ____________ (FOREMAN) Date ____________ Time ____________

SECTION B

☐ FLAME & WELDING PERMIT

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:
FIRE & SAFETY INSPECTOR:
PERMIT EXTENSION:
FIRE & SAFETY INSPECTOR:

SECTION C

☐ CORROSIVE MATERIAL

☐ Acid ☐ Caustic ☐ Solvent

☐ Suggested Check Points Followed.

SPECIAL PRECAUTIONS:

INDUSTRIAL HYGIENE – SECTION D

☑ Radiation Evaluation Needed.

Respirator Required: ☑ Airline ☐ Chemical Cartridge Type ☐ Dust Type ☐ None

EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):
β + γ [illegible] 7.5 mreps/hr. γ ____________ mr/hr.
RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):
2 [illegible] HRS. – FRONT
EXPIRATION DATE: 8-8-84
IND. HYGIENE & RADIATION DEPT. A. HOLSTEIN

RE-EVALUATION DATA

EXTERNAL RADIATION (AT WORKING DISTANCE):
β + γ ____________ mreps/hr. γ ____________ mr/hr.
RECOMMENDED TIME LIMIT (PER MAN, PER WEEK):
EXPIRATION DATE:
IND. HYGIENE & RADIATION DEPT.:

SPECIAL PRECAUTIONS:

SECTION E

☐ ACCESS PERMIT ☐ Suggested Check Points Followed.

Atmospheric Considerations: ☐ Toxic Gas or Vapor ☐ Oxygen Deficiency ☐ Flammable Gas or Vapor ☐ Not Applicable

SPECIAL PRECAUTIONS:

PERMIT EXPIRES:
FIRE & SAFETY INSPECTOR:
PERMIT EXTENSION:
FIRE & SAFETY INSPECTOR:

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NLO-HAS-973 (REV. 10/26/65) REPLACES NLO-HAS-352, & NLO-HAS-556

Senator **Cochran**. We will now take a 10-minute break. And when we reconvene, we will have before the committee the attorney general, Anthony Celebrezze.

[A short recess was taken.]

Senator **Cochran**. I'll introduce the next witness.

Time doesn't permit us to take the oral testimony of everyone who would like to testify, but we want to let you know that it is perfectly all right to submit to the committee any writing, any letter, or statement for the record, and this testimony will be included in the transcript of the hearing and given just as much weight as if it were delivered to the committee through oral testimony. So, the record for this hearing will remain open for a period of some 2 weeks after the conclusion of the hearing to permit an ample opportunity for anyone to submit written testimony or other documents for our transcript.

I just understood during the break, for example, that there might be some documentation from the union on the question of whether or not there has been any effect on worker health as a result of uranium emissions at the plant. This will be received and be made a part of the record, and we thank you for providing that information to the committee.

Senator **Glenn**. And we may want to ask some additinal questions.

Senator **Cochran**. And, also, as Senator Glenn reminds me, additional questions may be submitted to witnesses who have testified. These questions will be submitted in writing, and we will request that responses to those questions be submitted to the committee in Washington.

We're very happy and honored to have present the attorney general of the State of Ohio, Anthony Celebrezze, with us today. We appreciate his being here, and we're looking forward to having the benefit of his testimony.

We have a copy of the statement which has been supplied to the committee. We thank you for that. That will be made a part of the record in its entirety, and we would encourage you to make any summary comments from that that you choose.

Mr. Celebrezze.

TESTIMONY OF ANTHONY J. CELEBREZZE, JR., ATTORNEY GENERAL OF THE STATE OF OHIO

Mr. **Celebrezze**. Thank you, Senator Cochran, Chairman, Senator Glenn, Congressman Luken.

I am Anthony J. Celebrezze, Jr., the attorney general of the State of Ohio.

I appreciate this opportunity to bring you up-to-date on Ohio's legal efforts to deal with the problems at the Fernald nuclear fuel enrichment facility and to answer any questions that you have.

I have with me this afternoon Assistant Attorney General Jack Van Kley and Assistant Attorney General Ned Dowd, who are our lead attorneys in our office on the legal actions concerning the Fernald facility.

As you know, there are two principal problems at the Fernald plant. First is the problem of the release of radioactive nuclides in the dust being emitted from the plant. There's also a serious hazardous waste problem at the site that's complicated by a dispute over Ohio or any State's legal right to regulate that particular hazardous waste situation. We've taken legal action on two fronts to deal with each of these problems.

First, on December 21 of last year, we notified the U.S. Department of Energy and the officials of NLO of our intention to file suite charging violations of both State and Federal hazardous waste laws and State water pollution laws at the Fernald facility. Federal law, as you're aware, requires that a 60-day notice be sent before any type of lawsuit could be filed in this type of a situation.

At the same time, we notified the Department of Energy and the Monsanto Research Corporation that we would also file a similar suit for violations at the Monsanto facility, which is located not very far from here, Miamisburg, Montgomery County.

In my letter concerning the Fernald plant, I cited 22 violations of State and Federal hazardous waste and solid waste laws, plus violations of Ohio's water pollution control statutes. The operators of the plant had failed to obtain the required State permits and licenses and file the required reports concerning the storage of hazardous wastes at the site.

One of our serious concerns is the determination of jurisdiction over mixed hazardous wastes. The Federal courts have said, almost beyond any kind of doubt, that the Federal Government has control over nuclear waste. On the other hand, the weight of the decision seems to be that State governments have control over hazardous waste.

The Fernald plant is an amalgam because it's mixed waste: It's part hazardous; part nuclear. All of the waste at Fernald is mixed and permits would be required from Ohio EPA, we feel, if the State has jurisdiction. We think that this particular determination is vital so that we can enforce State regulations and better monitor the pollution conditions at the facility.

In essence, we are asking the Department of Energy and the Fernald facility to only do as much as we ask private industry to do in our State to comply with the hazardous waste laws.

Their contention is that the plant is exempt from State control under the hazardous waste laws. We believe that the plant should be required to comply with these laws, particularly hazardous waste and water pollution laws, and we intend, if necessary, to establish this in a court of law.

Since we announced our intention to file suite, Department of Energy officials have contacted us and indicated they'd like to discuss the problem. We've been meeting with them, and I have to say that I'm encouraged that they've come a long way in the discussions to get at this problem.

The information that we've been gathering includes onsite evaluation of ground water pollution, pit construction and the contents of the pits, and also surface water contamination. We're working with Ohio EPA to determine what other studies will be valuable and then what kind of cleanup action would be warranted in this situation.

The Ohio EPA has already done some off site ground water well testing, as well as some onsite evaluation. I want to state again that, as long as we're making progress, we're willing to continue these discussions, but I remain with the option that we will bring litigation if it's necessary to keep things going. It's always good to avoid lengthly and costly litigation, but whatever agreement is reached must deal forthrightly with the hazardous waste problems at the Fernald facility.

I commend Senator Glenn and Congressman Luken for their active role in trying to bring about making Fernald a safe facility. I totally support the bills that they have introduced in the Congress to deal with the hazardous waste problems and to allow the U.S. EPA some jurisdiction over the problem. I think it's always better if you have a counterbalance; to prevent one agency, the Department of Energy, from being the judge, jury, and prosecutor in any given situation. I think we need the balance that's proposed by those bills to allow another agency jurisdiction to determine some of the safety problems.

The radioactive emissions present a more difficult legal problem for our State. Briefly, the difficulty stems from a decision by the U.S. EPA last October to withdraw its proposed air pollution standards for radionuclides. Without these standards, the State is severely hampered in its efforts to deal with the emission problem at Fernald and at the gaseous diffusion plant near Portsmouth, in Scioto County, OH. A Federal study has shown that the Fernald and the Portsmouth plants are the highest and third-highest emitters of radionuclides in the country, respectively.

On December 28, at the request of the Ohio EPA, I filed a petition in the U.S. Court of Appeals for the District of Columbia, asking the court to overturn the U.S. EPA's withdrawal of the air pollution standards for radioactive dust. To my knowledge, Ohio is the first governmental entity to challenge and petition the court for review of that action. In that action, we join three environmental groups: The Natural Resources Defense Council, the Environmental Defense Fund, and the Sierra Club. By filing that petition, I want to be asured that the State of Ohio will be involved in any court action in addressing that problem.

A little bit of background on this situation: The Calfornia Sierra Club originally sued the U.S. EPA for failure to promulgate standards for these radionuclide emissions. As a result of that action, there were some emissions regulations proposed. But in an attempt to force the U.S. EPA to finalize the regulations, the Sierra Club sued the U.S. EPA again, and in that second action the district court of California ordered the regulations to be finalized. Following that court order, the U.S. EPA withdrew the regulations entirely.

That was the point at which we failed our December petition for the review of the withdrawal of the standards in the District of Columbia Circuit Court. The California court held the U.S. EPA in contempt of court for pulling the regulations and, again, ordered them to develop radionuclide standards.

They responded to that action by appealing to the Ninth Circuit Court of Appeals and by coming up with a set of lenient standards as a final product. To be very blunt, the standards that they came up with are virtually useless. Any threshold is so low that the standards that they've proposed are almost the same as no standards at all.

On April 5, we filed another petition in the U.S. Court of Appeals in Washington concerning these air emissions. We challenged the effectiveness of their standards and, again, I state that they're so lenient as to be almost useless.

In addition, we've been active in the Federal courts in California in support of the Sierra Club in their lawsuit.

The U.S. EPA wants a standard to apply only to uranium mines and not to facilities such as the Fernald plant. They've defended this position by stating that facilities other than uranium mines don't require regulation. We disagree with this premise, and we'll do everything in our power to bring about a toughening of the proposed standards. We believe that facilities, such as Fernald, do indeed pose a health threat through radioactive emissions and that strict emission standards are therefore absolutely necessary.

I know that you are aware that the State is deeply concerned about this problem and, again, I commend Senator Glenn and Congressman Luken for taking leadership at the Federal level in trying to do something with this situation.

I want to, again, assure the members of the committee, and the citizens of Fernald and Crosby Township, that I'm personally committed to using all of the legal resources available to the State of Ohio to ensure that the operations of these sites comply with the State of Ohio's pollution control laws, and that the State is involved in the efforts to stop the pollution and clean up the sites.

Mr. Chairman, I appreciate the opportunity to appear before you today to present the State of Ohio's perspective in this situation, and at this point I would be happy to answer any questions.

Senator **Cochran**. Thank you, Mr. Attorney General, for being here and bringing the committee up-to-date on the activities of the State through your office in connection with the operation and management of safety and health issues at this facility.

You mentioned that there was some difficulty already identified by your office with the National Lead of Ohio and its storage of hazardous waste. You say that there has been a failure to get the appropriate licenses for storage of this waste. What procedures are available to a plant, such as NLO in Ohio, for onsite storage, or is there a State certified storage site that is identified as a place where hazardous wastes are taken? I'm curious because my State right now is involved in trying to make a decision about issuance of licenses for storage, and nobody wants a license to be issued to anybody because it would require or legitimize the storage of hazardous waste somewhere in the State. Is that a problem here, in Ohio, as well?

Mr. **Celebrezze**. Mr. Chairman, Senator Glenn, and Congressman Luken, we have procedures for getting permits and licenses through the Ohio EPA to store hazardous waste. We have facilities in the State of Ohio that can safely dispose of that waste if it's taken offsite to be disposed of.

Our problem with the Fernald facility was that it took Ohio EPA more than 15 months just to gain access to the site to try and get some scope of how serious the problem was, and to try and assist in dealing with the problem. But we do have procedures to get licenses and permits that would allow the storage of that waste at the Fernald facility. Private industry does it all the time. And, again, I say that we are only asking this facility to meet the same standards that we demand of the private sector of the State of Ohio.

Senator **Cochran**. Thank you very much.

Senator Glenn?

Senator **Glenn**. Thank you, Mr. Chairman.

One thing I would like to have you explain also, Mr. Attorney General, for the record, is the relationship between the Federal EPA and their standards and then, how those are administered and the State tiein, and how you get involved. I don't think that's probably clear to everybody, and I know back when I first got into this it was very confusing to me and I thought I understood it at the time. If you could outline the Federal legislation, who does it, who supports it, your filing suit on behalf of the Feds and all this thing that we go into, I think it would clarify it for everyone.

Mr. **Celebrezze**. Thank you, Mr. Chairman, Senator Glenn, Congressman Luken. We work closely with the Federal EPA, most times in a cooperative effort; sometimes, in an uncooperative effort; sometimes, in an adversary role, but the tiein or the linkage here, and it would be achieved ultimately by the bill that you and Congressman Luken have sponsored, by giving the U.S. EPA some authority over the Fernald site and the DOE operation of the 23 sites or plants of this type throughout the United States. First, it puts some checks and balances into the system.

Second, we would be able to, through some sort of agreement with the Federal EPA, get the Ohio EPA involved and get them to meet the standards that we've set in the State of Ohio. So, it's through a cooperative effort between the Federal EPA and the Ohio EPA that we would be brought into it, and then I think that we could work toward a satisfactory solution to this problem.

Senator **Glenn**. Thank you. I have put in legislation, along with Congressman Luken. It's Senate bill 892, and it clarifies this jurisdiction over mixed hazardous waste. And we worked very closely with your office, of course, in putting that together, and I think it would go a long way toward making this counterbalance and a checks and balances system.

Another thing that I would like to ask, also, is: The Center for Disease Control, out of Atlanta, has jurisdiction over some of these radiation and nuclear problems, and does investigative studies of these things around the country. Now, the Ohio Department of Health has looked into some of the problems out here, but as I understand, it does not, probably, have all the resources at their command they would like to have to look into that in more depth. We've had a tentative affirmative answer back from the CDC people in Atlanta, that they want to be cooperative, and I want to let everyone know today, if that does come through, perhaps they can work very closely with the Ohio Department of Health, and EPA, and your office in making sure that these things get done.

And so, we're not trying to spread this out to where nobody's really in charge and so nothing gets done, because DOE has the responsibility in the final analysis for getting this done out here. But we are trying to bring to bear as many experts as possible to help us clean this whole thing up. So, I don't know whether you've ever dealt with the CDC people out of Atlanta or not, but there's some others that you can enlist in getting information for you and for the Ohio Department of Health.

Mr. **Celebrezze**. Senator, I'll pledge to this committee that I will do all in my power to get any State agency that could assist in this to work with any other parties, and to bring to bear their total skill and expertise to get this thing resolved.

Senator **Glenn**. On page 10 of your testimony, you say that the EPA standards, you feel, are too lenient, and if you feel they're too lenient, I'd like to ask what standard you would support and what basis there would be for it; for instance, would you support the EPA staff's recommendation of 10 millirems per year for a whole body radiation, and 30 millirems per year of any organ? Now, that's a considerable change. It would be a much more stringent——

Mr. **Celebrezze**. That would be a more stringent requirement.

Senator **Glenn**. It would. Is your support for that just on the basis that they proposed it, or do we have any studies from here, in Ohio, that show that that would be about the right level that would back up EPA's proposal?

Mr. **Celebrezze**. Senator, we think the 10/30 would be a significant improvement for what EPA is proposing right now. I'm not sure that even that is a stringent enough requirement.

The technology that exists and, in fact, I think the equipment that's installed at the Fernald facility right now would be adequate to support an even higher standard. I don't think it's a matter of finding the equipment to monitor. I think it's a matter of getting the level as high as possible.

Senator **Glenn**. Some of the earlier testimony this morning, before you were here, and I knew these figures before, but just the average radiation that the average person in this country gets, just from natural sources, not from nuclear plants at Fernald or anyplace else, but just natural sources, varies from around 75 or 80 millirems per year at sea level up to around 150 to 180 at places like Denver, where if you live up in the mountains, there is less atmospheric protection against radiation. So, we all get somewhere, depending on where we live. We get between 80 and 170 millirems per year.

And they testified earlier, also, that just from fallout, nuclear fallout, we get about an additional 2 millirems per year.

Occupationally, people are permitted, in a plant like Fernald, to go up to 5 rems; in other words, 5,000 millirems per year, which is a whole different level of things than the average person would get.

I just wanted to put that in the record, because when we're proposing something as small as a 10-millirem addition to that 80 to 170 base that we're all saddled with, we're getting down to a pretty fine line there. And it would require a tremendous effort, I think, to get it down to that. Maybe, it's worthwhile. Maybe, we can achieve it. I don't know. I don't know what expenditure of funds would be required to do that, but it would be something we certainly should look into.

Thank you, Mr. Chairman.

Senator **Cochran**. Congressman Luken.

Congressman LUKEN. Thank you, Mr. Chairman.

Before I launch into my very brief inquiry of these witnesses, I want to apologize and advise the Chair and those present that the House is in session this afternoon, and I'm going to have to run up the road to Dayton and catch a plane and try to get there shortly after the House goes into session. We're going in session at 3 p.m. and there will be votes. So, I certainly would like to stay for the remainder, but my duty calls elsewhere.

Attorney General Celebrezze, you mentioned that the Ohio EPA took 15 months to get access to the plant site at Fernald, is that right?

Mr. CELEBREZZE. That's correct, Congressman. We began asking them and most of the initial response, up until we filed the 60-day notice, was denial of access or an uncooperative attitude. I have to, for the record, say that, since we've filed the 60-day notice, perhaps that was the two-by-four that got their attention, but we've begun having discussions and I think we're making some progress in getting at, or at least bringing the problems out into the open, and agreeing on what the problems are and beginning to talk about what we have to do to resolve them.

Congressman LUKEN. Well, I hope that all of these experiences have some therapeutic value, as far as the Department of Energy is concerned. We did have a statement, to which I referred earlier, from Mr. Cochran, that we must meet, as he said, the same or more stringent requirements as the private sector. That hasn't been your experience; that DOE meets the same or more stringent requirements than the private sector, has it?

Mr. CELEBREZZE. Mr. Chairman, Congressman Luken, I think we're working toward that. I honestly believe that.

Congressman LUKEN. Well, just to take a moment on that subject, do you think we could ever, or should we ever, say that DOE should be in production of defense materials, such as nuclear materials, that they would be bound by the same restrictions as the private sector? In your discussions with them, without going into great detail about it, do they advance the proposition that, because of the mobilization base that they represent in an emergency situation, that they might have to emphasize production at the expense of other matters? I mean, it certainly doesn't exculpate them in regard to the history that we've had here, but in certain circumstances would they have to be exempt?

Mr. CELEBREZZE. Mr. Chairman, Congressman Luken, I think one of the reasons why this problem has been brought about at all is that we have here a giant that was built on an emergency basis some 30 years ago and, essentially, has never been technologically updated to keep up with the state-of-the-art.

I agree that this plant does contribute to the national defense effort, and I assume, if there were some sort of a mobilization or some sort of national emergency, as in many other cases, there would be steps taken to insure the production coming out of that plant.

However, from our standpoint as a State, hazardous waste is hazardous waste whether it's produced by a Federal Government facility or whether it's produced by the private sector. A cloud of radioactive dust is the same for the person on the receiving end of the cloud whether it comes from a private facility of some kind or a Government facility. All we want is this plant to be upgraded to where it can meet the standard that we demand in this State of private industry.

In the case of a national emergency, history has shown that when there's a national emergency people pull together. We do what we have to do to meet the emergency. What we're talking about right now is the routine operation of a plant that is sorely outdated. It was built on an emergency basis in the first place. It is sorely outdated technologically now, and poses a health hazard to those who live around it.

Congressman **Luken**. So, the DOE is not advancing that type of argument with you now.

Mr. **Celebrezze**. Our discussion——

Congressman **Luken**. It's a defense facility and they should be exempt for that reason because of the mobilization aspect of it.

Mr. **Celebrezze**. No, sir. Our discussions on the hazardous waste aspect indicate that we've given them information on the standard that we demand of any facility in Ohio, and we're working toward some agreement that those standards will be met.

Congressman **Luken**. Thank you, Mr. Celebrezze.

Thank you, again, Mr. Chairman, for allowing me to participate.

Senator **Cochran**. Thank you, Congressman, for being here.

Senator Glenn has one other comment.

Senator **Glenn**. I just wanted it to be part of the record here regarding our witness here today. This is not the average attorney general across the country here from one State to another, and I don't put this in just because we're personal friends and have been for many years. But I think people should understand that while he may be the attorney general of the State of Ohio, he's also a captain in the Navy Reserve and head of the Naval Reserve District, I believe, in the Columbus area. And I put that in here because this is not someone who is just taking a lawyer's attitude toward this thing. He's been to school on nuclear matters. He's had inservice training in these matters, and has been interested in them, and has played a lead in this and has developed here in Ohio an expertise that other States are looking to and consulting with Tony. And if one State could be looked at as having almost a model approach to this thing, at least, among the other attorneys general, it would be Ohio. And, so, I just wanted to bring that up. This is not just another attorney general coming in. He's had experience in these areas. He has gone to school on them. He has taken a lead in it across the board, and working with EPA, and not only the hazardous waste area, nuclear area, but also on other EPA matters of pollution, air and water pollution, and so on, too. I wanted that also to be part of the record here today, and we're particularly glad to have you come and give your testimony today. Thank you much.

Mr. **Celebrezze**. Thank you.

Senator **Cochran**. Thank you, Senator.

Thank you, Mr. Attorney General, for being here and helping us. I didn't expect it to be such a warm welcome that I would get today, but I thank you for it anyway. [Laughter.]

Senator **Glenn**. I guaranteed our chairman a little while ago—I went out and made an inquiry a little while ago and found out that the air conditioning in this particular building gets turned on May 10. Thad then told me maybe that's a good reason why we should vote for revenue sharing, we could get it a little bit earlier. But I guaranteed him that we would hold no more hearings before May 11, anyway, in this room. [Laughter.]

Mr. CELEBREZZE. Thank you, Mr. Chairman.

Senator COCHRAN. Thank you for your hospitality.

[Mr. Celebrezze's prepared statement follows:]

PREPARED STATEMENT OF ANTHONY J. CELEBREZZE, JR.

Mr. Chairman, Senator Glenn, Congressman Luken:

I am Anthony J. Celebrezze, Jr., Attorney General of Ohio.

I appreciate this opportunity to bring you up-to-date on the State's legal efforts to deal with the problems at the Fernald nuclear fuel enrichment facility and to answer your questions. With me this afternoon are Assistant Attorneys General Jack Van Kley and Ned Dowd, who are our lead attorneys in our actions concerning the Fernald facility.

As you know, there are two principal problems at the Fernald plant. There is the problem of the release of radioactive nuclides in the dust being emitted from the plant. And there is also a serious hazardous waste problem at the site which is complicated by a dispute over the State's legal right to regulate the hazardous waste situation.

I have taken legal action on two fronts to deal with the problems.

On December 21st of last year, I notified the U.S. Department of Energy and officials of NLO, Incorporated, of my intention to file suite charging violations of both State and Federal hazardous waste laws and State water pollution laws at Fernald. Federal law requires that a 60-day notice be sent before any suit is filed against a Federal agency in this type of case. Incidentally, at the same time, I notified the Department of Energy and the Monsanto Research Corporation that I would file a similar suit for violations at the Monsanto facility at Miamisburg, south of Dayton in Montgomery County.

In my letter concerning the Fernald plant, I cited 22 violations of State and Federal hazardous waste and solid waste laws, plus violations of Ohio's water pollution control statutes. The operators of the plant have failed to obtain the required State licenses and file the required reports concerning the storage of hazardous wastes at the site.

One of our serious concerns is the determination of jurisdiction over mixed hazardous wastes. We believe that the State's hazardous wastes laws should take precedence. All of the wate at Fernald is mixed wastes, and thus permits would be required through the Ohio EPA. If the State has jurisdiction. We feel this determination is vital so that we can enforce State regulations and better monitor pollution conditions.

NLO and the Department of Energy contend that the plant is exempt from State control under the hazardous waste laws. We believe that the plant should, indeed, be required to comply with all State and Federal laws—particularly hazardous waste and water pollution laws—and we intend to establish this in court, if necessary. Since I announced my intention to file suit, Department of Energy officials have contacted us and indicated they would like to discuss the problem. We have been meeting with DOE officials and have been gathering information. This information includes onsite evaluation of groundwater pollution, pit construction and contents and surface water contamination. We are working with Ohio EPA to determine what other studies will be valuable and then what kind of clean-up action would be warranted. The Ohio E.P.A. has already done some off site groundwater well testing as well as some onsite evaluation. I am willing to hold discussions that might avoid lengthy and costly litigation, but I will insist that whatever agreement is reached must deal forthrightly with the hazardous waste problems at Fernald.

The radioactive emissions present a more difficult legal problem for the State of Ohio.

Briefly, the difficulty stems from a decision by the U.S. Environmental Protection Agency last October 23rd to withdraw its proposed air pollution standards for radionuclides. Without these standards, the State is severely hampered in its efforts to deal with the emission problem at Fernald and at the gaseous diffusion plant near Portsmouth in Scioto County. A Federal study has shown that the Fernald and

Portsmouth plants are the highest and third-highest emitters of radionuclides in the country, respecitvely.

On December 28th, at the request of the Ohio EPA, I filed a petition in the United States Court of Appeals for the District of Columbia, asking the court to overturn the U.S. EPA's withdrawal of the air pollution standards for radioactive dust.

Ohio is the first governmental entity to petition the court for review of U.S. EPA's action, joining three major national environmental groups; The Natural Resources Defense Council, the Environmental Defense Fund and the Sierra Club. By filing our petition, we will assure that the State will be involved in any court action addressing the problem.

To provide some background information on this action:

The California Sierra Club sued the U.S. EPA for its failure to promulgate standards for radionuclide emissions. As a result of that action, the U.S. EPA proposed emissions regulations. But in an attempt to force U.S. EPA to finalize the proposed regulations, the Sierra Club sued the U.S. EPA again. As a result of that action, a Federal district court in California ordered the regulations finalized. Following that court order, the U.S. EPA withdrew the regulations entirely.

At this point, we filed our December 28th petition for review of the withdrawal of the standards in the D.C. Circuit Court. The California court found the U.S. EPA in contempt of court for withdrawing the regulations and again ordered the Agency to develop radionuclide standards. U.S. EPA responded to that action by appealing in the 9th Circuit Court of Appeals and by coming up with a set of lenient standards as a final product. I will explain the reason it gave for this in a moment.

On April 5th of this year, we filed another petition in the U.S. Court of Appeals in Washington, D.C. concerning the radioactive air emission standards, (the latest from U.S. EPA) challenging the effectiveness of U.S. EPA standards, which we consider to be too lenient. In addition, we have filed an amicus brief in the Federal appeals court in California in support of the Sierra Club.

The U.S. EPA wants standards to apply only to uranium mines, and not to facilities such as the Fernald plant. U.S. EPA has defended this position by stating that facilities other than uranium mines do not require regulation. We disagree with this premise, and we will do everything in our power to bring about a toughening of the proposed standards. We believe facilities such as Fernald do, indeed, pose a health threat through radioactive emissions and that strict emission standards are therefore absolutely necessary.

I know you are aware that the State of Ohio is deeply concerned with the problems at Fernald, and intends to use all of its resources to deal with the situation.

I want to assure the members of the committee, and the citizens of Fernald and Crosby Township, that I am personally committed to using all of the legal resources available to me to ensure that the operators of these sites abide by Ohio's pollution control laws, and that the State is involved in the efforts to stop the pollution and clean up the sites.

Again, I thank you for the opportunity to appear before you today. I will be happy to answer your questions.

Senator **Cochran**. Mr. Guimond, please proceed.

TESTIMONY OF RICHARD J. GUIMOND, DIRECTOR, CRITERIA AND STANDARDS DIVISION, OFFICE OF RADIATION PROGRAMS, U.S. ENVIRONMENTAL PROTECTION AGENCY, ACCOMPANIED BY KENNETH SHUSTER, CHIEF, LAND DISPOSAL BRANCH, OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE, EPA, AND WILLIAM FRANZ, CHIEF, ENVIRONMENTAL REVIEW BRANCH, REGION 5, EPA; AND PHILIP J. BIERBAUM, DEPUTY DIRECTOR, DIVISION OF SURVEILLANCE, HAZARD EVALUATIONS AND FIELD STUDIES, NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH, CENTERS FOR DISEASE CONTROL, PUBLIC HEALTH SERVICE, DEPARTMENT OF HEALTH AND HUMAN SERVICES, ACCOMPANIED BY JAMES MELIUS, M.D., CHIEF, HAZARD EVALUATIONS AND TECHNICAL ASSISTANCE BRANCH

Mr. **Guimond**. Thank you very much Mr. Chairman.

Senator Cochran, Senator Glenn, Mr. Luken ladies and gentlemen, in the interest of brevity I will attempt to summarize the written testimony to be provided today.

My name is Richard Guimond. I'm the Director of the Criteria and Standards Division in the Office of Radiation Programs.

I am responsible for directing the Agency's regulatory environmental radiation protection program, including development of standards for the disposal of high-level and low-level radioactive waste, and the control of radioactive air emissions.

I also have with me today, on my left, Mr. Ken Shuster, Chief of the Land Disposal Branch in the EPA's Office of Solid Waste and Emergency Response, and, on my right, Mr. Bill Franz, Chief of the Environmental Review Branch in EPA's Region 5 office in Chicago.

I appreciate the opportunity to discuss EPA's role in regulating hazardous pollutants from the Department of Energy facilities.

You requested that the Agency's remarks address several areas, including EPA's statutory authorities and regulations, the risks associated with the releases at DOE's Feed Materials Production Center, the relationship of EPA with the State of Ohio in environmental protection activities concerning the FMPC, and coordination with the new Office of Science and Technology's policy committee on radiation issues. My statement covers these areas in various degrees of detail. If you would like additional information, we can try to provide it during the questioning period or furnish written responses for the record.

I would first like to discuss generally the Agency's statutory responsibilities applicable to the management of hazardous pollutants at DOE facilities.

Executive Order 12088 established the executive branch program that requires Federal agencies to comply with appropriate environmental statutes and regulations. Each Federal agency is responsible for ensuring that facilities under its jurisdiction comply with applicable Federal, State, and local environmental standards and procedural requirements, and develop schedules for compliance and budget whatever funds are necessary to bring its facilities into compliance.

To carry our its responsibilities under the Executive order, EPA has established its Federal Facilities Compliance Program. The goal of the program is to bring Federal facilities into compliance with applicable pollution control standards through cooperative efforts among the affected agencies. EPA has the responsibility to ensure that the intent of the program is met and provide necessary technical advice and assistance, conduct reviews and inspections, and resolve disputes between Federal agencies, EPA, and States regarding noncompliance by Federal facilities.

In addition to the oversight role provided by Executive Order 12088, EPA implements several environmental laws which affect the activities of DOE facilities. These include the Clean Air Act, the Resource Conservation and Recovery Act, the Clean Water Act, the Safe Drinking Water Act, the Comprehensive Emergency Response, Compensation and Liability Act, and the Atomic Energy Act.

The Clean Air Act, as amended in 1977, provides the agency several avenues for regulating air pollution. The agency recently promulgated a standard to limit radionuclide emissions to air from DOE facilities. I will discuss the details of this standard and our approach to implementing it a little later on.

Under RCRA, EPA's responsible for regulating hazardous waste, including DOE facilities. However, RCRA excludes source, special nuclear, or byproduct material as defined by the Atomic Energy Act from EPA jurisdiction.

The Clean Water Act requires that EPA limit the discharge of hazardous pollutants into the Nation's waterways. Under this act, the Administrator, or a State that has been delegated authority to implement the act, must issue a permit for the discharge of any pollutant from any facility, including those owned by the Department of Energy.

As the Clean Water Act protects the Nation's navigable waters, the Safe Drinking Water Act protects the water which the public ingests.

The Agency also has the authority to advise the President and issue guidance to all Federal agencies with respect to radiation matters. This authority is derived from the Atomic Energy Act. Under it, EPA, in cooperation with several agencies, including DOE, is currently revising guidelines for occupational exposures. These new guidelines will be applicable to DOE facilities.

I would now like to address in more detail some of the Agency's primary statutory responsibilities applicable to the DOE facilities. First, the Clean Air Act. I am only going to discuss the Agency's recently promulgated rule limiting radionuclide emissions to air from DOE facilities since that standard has the most relevance to today's hearing.

On January 17, 1985, EPA promulgated emission standards under section 112 of the Clean Air Act for DOE facilities, NRC-licensed facilities and non-DOE Federal facilities, and elemental phosphorus plants. These standards are promulgated in response to an order from the U.S. District Court for the Northern District of California, which directed EPA to either promulgate final standards for these source categories or determine that radionuclides are clearly not a hazardous air pollutant. To fully understand the rationale for the standards issued on January 17, it is necessary to explain some of the extensive technical and legal proceedings prior to the promulgation.

The 1977 amendments require EPA to consider whether radionuclides constituted a hazardous air pollutant. After extensive litigation and rulemaking proceedings, Administrator Ruckelshaus thoroughly considered the available technical information and decided to withdraw the proposed standards on October 23, 1984. For three categories, he concluded that current practice provided an ample margin of safety in protecting the public health from the hazards resulting from exposure to radionuclides from these sources. With no further control of these facilities' emissions, no single source category would contribute more than one additional cancer every 13 years, and no individuals would be exposed to an increased lifetime cancer risk of greater than about one chance in one thousand. The Administrator considered these additional risks to be acceptable in light of the normal lifetime risk of fatal cancer of about 175 chances in a 1,000.

The Sierra Club challenged the Agency's decision in the district court, and on December 11, 1984, the district court found the Administrator and EPA in contempt and ordered the Agency to issue final standards or make a finding that radionuclides are clearly not a hazardous pollutant. EPA complied with the order by promulgating final standards for all 4 source categories for which standards were originally proposed. However, litigation continues on this rulemaking.

The standards established by EPA for DOE facilities limit radionuclide emissions to an amount that causes a dose equivalent rate of 25 millirems per year to the whole body or a dose equivalent rate of 75 millirems to the critical organ of any member of the public. Exposure at these levels for a 70-year period is associated with an increased individual lifetime cancer risk of about one chance in 10,000. DOE may request that EPA establish an alternative standard at higher level for specific facilities, if it can be demonstrated that no member of the public will receive a continuous exposure of more than 100 millirems per year effective dose equivalent, and a noncontinuous exposure of more than 500 millirems per year from all sources, excluding natural background and medical procedures. We have not yet received such a request. Exposure for a 70-year period at 100 millirems per year effective dose equivalent is associated with an increased individual lifetime cancer risk of about one to two chances in one thousand.

The values for the final standards promulgated in January were selected for several reasons.

First, they are consistent with the October decision that current practice protects the public health with an ample margin of safety.

Second, the limits ensure that emissions do not increase over present levels.

Third, the standards are generally consistent with the recommendations of the National Council on Radiation Protection and Measurements and the International Commission for Radiation Protection.

EPA is now developing an implementation plan for these airborne radionuclide standards.

Under RCRA, EPA is to define what is a hazardous waste, and issue regulations for hazardous waste generators and transporters, and for owners and operators of hazardous waste treatment, storage, and disposal facilities. Under the RCRA regulations issued by EPA, generators are responsible for determining if they have a hazardous waste.

There are several provisions in the 1984 RCRA amendments that extend EPA's authority and which may be useful at the FMPC site.

First, these amendments direct that all treatment, storage, and disposal facility permits issued after November 8, 1984, require corrective action for all releases of hazardous waste or constituents from any solid waste management unit regardless of the time at which the waste was placed in such unit. This is referred to as a continuing releases provision.

Second, whenever EPA determines that there is or has been a release of hazardous waste into the environment from a RCRA interim status hazardous waste facility, EPA may issue a corrective action order as needed to protect human health or the environment.

Third, EPA shall require corrective action beyond the facility boundary where necessary to protect human health and the environment unless the owner or operator demonstrates that he is unable to obtain the necessary permission to undertake such action. EPA is to use corrective action orders until rules are developed to implement this provision. However, as mentioned before, current RCRA regulations apply only to wastes that are not source, byproduct, or special nuclear material.

The agency's authority to handle radioactive waste at DOE facilities is somewhat expanded by the CERCLA, which defines hazardous substances as including any hazardous air pollutants listed under section 112 of the Clean Air Act.

However, EPA is authorized to spend Superfund money only on removal actions at Federal facilities and is not authorized to spend Superfund money for remedial actions at these facilities. Despite its authority to issue administrative orders to DOE, as well as other Federal facilities, under the Federal Facilities Compliance Program, EPA has generally attempted to negotiate compliance agreements with Federal facilities in need of CERCLA response actions.

EPA has delegated to the State of Ohio the authority for day-to-day operations and enforcement of environmental programs in the State. The State of Ohio has been delegated authority for implementation of the Clean Air Act, with the exception of airborne radionuclides; the Clean Water Act, and interim authorization phase I for the Resource Conservation and Recovery Act.

Under the Clean Air Act and Clean Water Act, the role of the State is to assure compliance through permit issuance, site inspections, review of pollution control plans, and, when necessary, enforcement actions.

Our agency has an oversight role to assure that a State is carrying out its responsibilities and to provide assistance to a State when asked.

Under RCRA, the State of Ohio has been delegated authority for inspecting interim status facilities to determine complianoe with the RCRA-based regulations and for enforcement where noncompliance is determined.

The State has inspected the FMPC for compliance with the RCRA regulations. It has also provided the EPA with the information on ground water monitoring conducted as part of their program. This monitoring constituted part of their investigation of the ground water contamination to determine whether chemical constituents, in addition to uranium, have contaminated the ground water.

EPA Region 5, conducted a compliance inspection of the FMPC facility on March 16, 1984. Several violations associated with container storage of waste and surface impoundments were identified. Region 5 sent the inspection report to the State of Ohio for appropriate action. The Attorney General has served DOE with a notice of intent to file suit for RCRA violations. DOE has informed EPA Region 5, that it has met twice with the State of Ohio regarding the proposed lawsuit, and it may be possible to settle the issue with Ohio to correct all violations short of trial.

EPA issued a NPDES permit to the FMPC on October 2, 1980. After the permit was issued, EPA delegated the program to the State. The State of Ohio is the process of reissuing the NPDES permit and is negotiating a new compliance schedule with DOE for FMPC.

EPA will continue to coordinate actions with the appropriate State agencies as necessary.

In February 1985, region 5 conducted a preliminary review of the environmental impacts of past and present activities at the FMPC facility. As a result of that review, region 5 identified a number of concerns which were outlined in a letter sent to DOE in March from the regional Administrator. I will submit a copy of this letter for the record. The letter included region 5's comments about existing operations and the region's environmental concerns, and identified addtional information necessary to do complete assessment of the facility.

[The letter referred to follows:]

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

REPLY TO ATTENTION OF:

5ME-12

[illegible], Ohio,
[illegible], E[illegible]

MAR 9 1986

Mr. Joseph LaGrone
Manager Oak Ridge Operations Office
U.S. Department of Energy
P.O. Box E
Oak Ridge, Tennessee 37831

Re: Feed Materials Production Center, Fernald, Ohio

Dear Mr. LaGrone:

The United States Environmental Protection Agency (U.S.EPA) Region V, has conducted a preliminary review of the environmental impacts of present and former activities at the United States Department of Energy Feed Materials Production Center (FMPC), Fernald, Ohio. The Agency's review was initiated as a result of the State of Ohio's Notice of Intent to Sue which was filed on December 18, 1984, pursuant to Section 7002 of the Resource Conservation & Recovery Act, 42 U.S.C. § 6927.

Pursuant to Executive Order 12088, and provisions contained in each of the major environmental statutes, federal facilities are required to comply with Federal environmental standards and regulations. Executive Order 12088 also provides that U.S.EPA shall act as technical advisor to assist other Federal agencies to achieve compliance.

U.S. EPA's review of the environmental impacts associated with the ongoing operation of the FMPC has identified the following major concerns: (1) the radiation monitoring program is inadequate; (2) there have been incidents of radioactive air emissions due to unsatisfactory operation and maintenence of control equipment; (3) the groundwater monitoring plan prepared by Dames and Moore for FMPC is inadequate; (4) there is a possibility that individual, non-community, and community drinking water supplies have been contaminated; and (5) the National Permit Discharge Elimination System (NPDES) permit monitoring requirements do not reflect the potential for discharge of radionuclides and other chemicals. Our attached comments address these concerns in detail.

Bill Franz of the Environmental Review Branch will call you within the next 10 days to arrange a meeting to discuss the Federal Facility Compliance Program procedures in light of our concerns, after staff at your agency have had the opportunity to review our comments. In the interim, if you have any questions regarding this letter or our attached comments, please contact Mr. Franz, at FTS 886-7500.

Sincerely yours,

/s/

Valdas V. Adamkus
Regional Administrator

cc: Don Marshall, OEPA Dayton
Robert Sleeman, DOE
Tom Winston, OEPA Dayton
Roger Hannahs, OEPA Columbus
Robert Quilian, Ohio Dept. of Public Health Columbus
Bobby Joe Davis, DOE Oak Ridge, Tennessee
Vincent Fayne, DOE Oak Ridge, Tennessee

bcc: Gary Gulezian 5AR
Larry Jensen 5AR
Larry Kertcher 5AC
George Hurt 5AC
Bill Miner 5HE
Bill Muno 5HE
Ron Lillich 5HE
Ken Fenner 5WQ
Robert Hilton 5WG
Joe Harrison 5WD
Babatte Newberger 5RC
✓Mary Ellen Lynch 5R
Irene Little 5R

Environmental Protection Agency Region V's Comments on the Groundwater Study Workplan and the Environmental Reports for the Feed Materials Production Center (FMPC), Fernald, Ohio

The following comments are a compilation of the issues of environmental concern to the U.S. EPA from a problem-oriented perspective. We have identified the problems, the applicable regulations, and our proposed recommendations for solutions or further studies. These comments should lay the groundwork for negotiations between our respective agencies in regard to appropriate measures to be implemented in order to resolve our concerns.

1. INADEQUACY OF RADIATION MONITORING PROGRAM

A. INCONSISTENT STANDARDS

The standards applied in the National Lead of Ohio (NLO) Environmental Monitoring Annual Reports (ER) and the Dames and Moore Draft Task Force Report are generally equal to or, in three cases, more conservative than comparable Nuclear Regulatory Commission (NRC) standards (10 CFR 20). There are, however, a number of standards applied which are significantly less restrictive and some instances where there are no apparent standards which can be applied.

Air

The Dames & Moore report refers to a DOE standard of 3 mg/m^3 for uranium in air (Table 9, pg 2-36). This converts to 2 x 10^{-9} uCi/ml and compares to 5 x 10^{-12} uCi/ml for uranium-natural in the 10 CFR 20 standards. There appears to be a factor of 400 difference between these two standards. Is this an error, or is the DOE standard really 400 times less stringent than the NRC standard?

Water

The 1983 ER uses a radium in water standard of 30 picocuries per liter (pCi/l) when applied to well water samples (Table 5, pg 19). At least one of these wells is at a private residence. EPA's drinking water standard for combined radium-226 and radium-228 is 5 pCi/l. Consequently, the standard being used (it appears the DOE standard is 30 pCi/l for each of the two radiums) is at least 12 times less stringent than actual or anticipated EPA community drinking water standards. Although EPA's standards apply directly to community water systems, not individual wells, the variance in standards is still worth noting. The basis for using 30 pCi/l rather than the EPA standard should be explained.

The 1983 ER uses a standard of 1.2 x 10^{-6} uCi/ml (1200 pCi/l) for uranium in well water (Table 5, pg. 19). While this compares with 3 x 10^{-5} uCi/ml in the 10 CFR 20 standards, it can also be compared to an anticipated EPA uranium in drinking water standard of 100 pCi/l or less, perhaps even 40 pCi/l. Again, there is considerable difference in these standards, and the justification for that difference should be spelled out.

Milk

Uranium in milk concentrations are tabulated in the 1983 ER (Table 13, pg 33); uranium in soil and sediment concentrations are also tabulated in the 1983 ER (Tables 8, 9, 10, pg 23 & 26) however, no standards for judgment are given. The basis for judging whether there is a risk associated with these concentrations must be delineated.

Specific Activity

Finally, the report fails to make the change in specific activity for uranium which had been made in NLO's 1983 ER, thereby introducing a factor of two error in activity and dose estimates. The 1983 ER notes (pg 14) that, in the past, a specific activity of 3.33 x 10^{-7} uCi/gm was used to convert the analytical results to activity, but was being changed to 6.77 x 10^{-7} uCi/gm to correspond to NRC practice. Dames and Moore failed to make this correction in their reports, which could lead to an underestimate by a factor of two in activities and, therefore, in dose. This discrepancy should be resolved.

B. INADEQUATE SAMPLING

Substantial problems are evident in the environmental monitoring program because analytical programs focus too narrowly on uranium to the exclusion of other critical radionuclides. Radium analyses should be expanded, especially with well water. In addition, very little attention has been paid to transuranics, although they are released into the air and surface water.

The sampling programs are not consistent in time or site. If collections were made at all similar sites at the same time and analyses performed uniformly on all samples, it would greatly aid in comparison and assessment of data.

Air

For the ambient air concentrations gross beta, uranium, neptunium, plutonium, and thorium concentrations are compiled in the 1983 ER (Tables 1 and 2). It is not clear whether these are the only radionuclides present or the only ones compiled. A clarification is needed. No mention is made of whether gamma-ray screening was performed routinely or whether offsite air monitors were used. This is a clear deficiency. The reasons for this limited approach should be detailed.

Water

Radioactive contaminant levels in water are compiled in the 1983 ER (Tables 5 and 6). Uranium, radium-226, radium-228, gross alpha and gross beta concentrations are listed in Table 5. The table has a number of peculiarities as the analyses performed are not consistent across the sites. Uranium, gross alpha and gross beta analyses are performed at sites W1, W3, W4, W5, W7 and W8. Radium analyses are performed at sites W1, W3, W4, W5, W7 but not W8. No results are reported at all for W6. Analyses at W2 are extremely detailed, unlike the other sites, and include values for cesium, neptunium, plutonium, radium, ruthenium, strontium, technetium, thorium, and uranium. The reason for the decision to further limit sampling at the remaining sites should be provided.

Again, in Table 5, radium samples are collected without consistency. W1 and W3 data are prepared, from 1-month composites of daily samples; W4 data are prepared from 1-month composites of weekly samples; W7 data are prepared from composites of all available weekly samples; W5 data are prepared from 2-month composites of weekly samples; and W2 data are prepared from 1-month composites of daily samples. No mention is made of W8. This nonuniform sampling protocol makes inter-comparisons of data bv time and place very difficult, if not impossible. A uniform collection system should be devised.

Table 6 lists many specific radionuclides that are analyzed on a nonuniform schedule. Twenty-four hour samples are analyzed for uranium, gross alpha and gross beta. One month composites of daily samples are analyzed for radium-226, radium-228, ruthenium-106, and thorium. Long-term composites are analyzed for other radionuclides. Again, there is no consistency in radionuclide analyses performed. A uniform sampling schedule for the parameters of interest should be developed.

Table 12 lists 21 offsite wells sampled from 4 to 12 times per year. No description is given of the tvpes of wells, although the Dames & Moore reports do distinguish between domestic and commercial wells. Some are known to be residential. Nine of the wells are sampled less than six times per year, while the remainder are sampled 11-12 times per year. Only uranium results are compiled; however, radium could be an associated contaminant if uranium is present. Minimally, the radium concentrations should have been found in order to assess whether DOE water standards have been met. Consideration should be given to analyzing for pollutants other than uranium: transuranics might also be suspected contaminants. Gamma screening would also be very useful on these well samples.

Aquatic biota sampling should be included in sampling of both Paddy's Run Creek and the Miami River. In addition, there was no mention made of cistern sampling which should also be included in the monitoring program.

Soil

Soil samples were taken in 15 locations both onsite and offsite. Sediment samples were taken from seven onsite locations and seven Miami River locations. One was taken far offsite. Uranium and technetium analyses were performed on sediments and uranium analyses on soils.

Again, why not the same analyses on all samples? If other analyses were done, such as transuranics, no results were reported.

Milk and Other Farm Products

Table 13 lists results for uranium in milk analyses from two farms, one neighboring and one 18 miles distant. This is an extremely small sample population, in view of the fact that the plant is located in farm country. Many critical pathways were not covered in the sampling programs. Farm country pathways through forage and feed to food sources and food products, except for milk, are not discussed. Results for uranium analyses on vegetables are referenced on the bottom of page 36 of the 1983 ER, which is the only reference to analyses taken on food pathways other than milk. No vegetable analytical results are tabulated, nor are collection procedures discussed.

Gamma-ray Doses

Table 15 shows that the seven monitors placed at the fence line give dose rates about what would be expected, based upon the national average radiation background. The lack of background and offsite monitors used for air sampling and gamma-dose rate measurements should be addressed.

Flyash Piles

Flyash piles generally contain considerable uranium, radium, and thorium. These should be included in the monitoring program, particularly in terms of runoff, seepage, blowoff, and radon emissions.

C. CONCLUSIONS FROM DATA REVIEW

It is our conclusion that contamination is definitely present in offsite wells and soils near the east fence line. Several unanswered questions are presented by the elevated gross alpha, gross beta, technitium 99, and uranium levels at some sites. The origin of the radium 228 in water discharges for 1983 also remains unexplained, since thorium was not processed at FMPC that year. There is a considerable difference between dose projections presented in the 1983 ER and the EPA offsite dose projections developed for the Clean Air Act background material.

Water

Table 5 shows uranium, radium-226, and radium-228 concentrations in water to be less than 10% of the DOE standards. Gross alpha concentrations were 17% and 26% of the standard at sites W7 and W8, respectively. Gross beta concentrations varied between 20% and 70% of the DOE standards, with W7 and W8 being 53% and 70% respectively. The source of these alpha and beta emitters should be provided, particularly if the uranium and radium concentrations are low.

In Table 6, the radium-228 concentration at W2 is 32% of the standard. This is surprising because the ER states thorium was not processed on the plant that year (1983). What is the source of the radium-228? Technetium-99 and uranium levels are also elevated, with uranium running 51% of the DOE standard. Shouldn't control measures be instituted to bring these discharges down? What is (are) the reason(s) for the higher discharges?

Table 11 shows uranium concentrations in onsite monitor wells range between 1 and 26.5mg/l, while Table 12 shows offsite wells range between 0.2 and 431 mg/l. The latter converts to 0.14 - 292pCi/l and can be compared with EPA uranium in Ohio well and surface water data (<2pCi/l) and with an anticipated EPA uranium in drinking water standard in the range of 40 100 pCi/l. Of the three wells that exceed 40 pCi/l, two are commercial and one is domestic. The domestic well has a concentration of 140 pCi/l. The reason for the delay in beginning the sampling of offsite wells should be addressed. It is apparent the onsite monitor wells are not an indicator of offsite contamination.

Soils and Sediments

Table 8 lists uranium concentrations in soils onsite and offsite. No standards are given in the ER by which to judge these levels, which range from 2 - 53 pCi/gm. The basis for judging the soils should be provided. Radium and transuranic concentrations, if elevated, would have been very useful but were not given. Soil uranium concentrations ranged from 2-53 pCi/gm and can be compared to normal soil levels at about 1 pCi/gm. Those sites at the east fence line (sites 3 and 11) show definite contamination.

2. AIR EMISSIONS AND LACK OF ADEQUATE OPERATIONS AND MAINTENANCE PROGRAM

The steps required in uranium metal processing are quite difficult and require extensive surveillance, in order to keep radioactive releases to a minimum. The various types of air pollution control equipment used, the nature of the process, and the harm that any release of radioactive material into the atmosphere can cause require that the source adhere to very strict operating and maintenance practices. The release of radioactive material reported on December 11, 1984, indicates that the existing operating and maintenance practices at FMPC should be reviewed, and changes made to improve the procedures.

The FMPC has been an ongoing operation since 1954 and; since it is projected to be in operation beyond 1990, all air pollution control devices should be tested for performance again, even though they were initially tested when installed. Most devices, in constant use, will deteriorate and lose efficiency. A testing program, as suggested, would identify any devices needing upgrading or replacement. FMPC should also acquire and install automatic monitoring instruments to be used at the baghouses. These instruments would warn the operators of any breakdown of the filtering system much sooner than the instruments now installed in the stack.

Again, we would strongly suggest that an effective operating and maintenance program be developed and implemented for all air pollution control devices and instruments.

Congressmen Dingell and Luken requested USEPA to review the steps the DOE plans to take to prevent a recurrence of releases of radioactive material at FMPC. The corrective actions proposed by DOE appear to be interim in nature. We recommend that the following measures be included in the plan of action:

A. Include an on-site Senior Environmental Engineer and necessary technicians in the proposed cadre of specialists.

B. Develop an operating and maintenance program dedicated to the upkeep and operation of all pollution control equipment (air, water, etc.).

C. Assign experienced and skilled craftsperson to the maintenance and operation of all pollution control devices. These craftspersons should be responsible for pollution control only, and not be diverted to production activities.

D. Develop a record-keeping program to log incidents of malfunctions that could create radioactive releases.

E. Research the possibility of installing two baghouses in series at the plants where radioactive releases could occur.

F. Authorize the senior member of the on-site cadre of specialists to shut down any equipment if it is determined that a radioactive release could occur.

G. Maintain an inventory of essential spare parts for all the pollution control devices and monitoring instruments.

H. Train all personnel involved with pollution control activities in the safety, operation and maintenance of the control devices and instruments.

I. Provide responsible pollution control supervision and management to assure that the personnel and equipment are performing in a satisfactory manner.

In case of an accident, the facility could emit anhydrous hydrogen fluoride and ammonia in sufficiently large quantities to cause injury to persons beyond the property line. EPA does not require that there be contingency plans for such an eventuality, but we do believe it would be prudent to have such plans in place to minimize the likelihood of injury. An Emergency Response Plan should cover the likelihood of releases of any hazardous materials, and include actions to be instituted outside of the plant proper, should this be necessary.

Our telephone communications with the Southwestern Ohio Air Pollution Control Agency revealed that there is currently a consent decree covering the FMPC's boilers. The Agency and FMPC are working together to procure a submittal of operating permit applications for all facilities at FMPC. Once these applications are submitted, they should be reviewed in regard to control devices and areas requiring control at the site.

3. INADEQUACY OF FMPC GROUNDWATER MONITORING PLAN

A. NATURE OF CONTAMINATION

Uranium has been identified as the primary constituent of interest in the groundwater monitoring plan proposed by Dames and Moore. Sites at the facility which have the potential for affecting ground water, e.g., infiltration from Paddy's Run Creek and related storm water drainage, fly ash piles, waste piles and waste pits and drainage from the plant production area, as well as air-released contaminants should be identified and characterized by actual waste analyses, EP toxicity tests and review of historical records. Only when the list of potential contaminants is available can an effective monitoring program be developed. For example, if uranium is primarily in the form of uranium oxide, the monitoring program will look quite different from a plan for a more soluble constituent like uranium nitrate.

Additionally, parameters selected for analysis should reflect the types of materials used in the manufacturing process and of wastes generated presently and in the past at FMPC, including specific organics and heavy metals. FMPC should conduct a thorough review of present and past waste handling and conduct an inventory of all chemicals and radioactive material used.

General information on materials and chemicals disposed in the waste pits should be provided, including but not limited to information on the wastes placed in the pits, the period of time wastes were received at each pit, when they were closed, how closure was completed and whether or not a liner was used in the construction of the waste pits. Information should also be provided on whether the wastes have been representatively sampled, the results of any sampling, whether the pits ever received hazardous waste(s), whether the liquid waste from the general sump has been tested for organics or heavy metals prior to discharge to the liquid waste pit, and the method and location of disposal of the sludge from the sump.

B. HYDROGEOLOGIC REGIME

The Dames and Moore report describes surficial local geology as glaciofluvial deposits that are highly variable in composition, thickness and areal extent. Shallow material is clayey till overlying a thick sand and gravel aquifer containing clay lenses. Movement of uranium-enriched clay particles can take place through fractures and joints in the clay till and through coarse sands and gravels.

The factors that will influence whether the contaminant accumulates or is transported include permeability and grain-size distribution relative to clay content and filtering capability. This information should be provided by a careful drilling, soil sampling and analysis program.

C. DRILLING, WELL CONSTRUCTION AND SAMPLING CONSIDERATIONS

The goal of any groundwater monitoring program is to obtain a sample of representative formation water from the zone being monitored. Any proposed drilling technique must be evaluated relative to its potential affect on the targeted constituent. Dames and Moore has proposed the use of conventional mud rotary drilling techiques for FMPC. Field experience has shown that it may be practically impossible, using conventional well-development techniques, to completely remove all traces of drilling mud from the formation. Zones of "lost circulation" encountered during drilling can accept large volumes of mud that are essentially irretrievable. The overpumping technique described by Dames and Moore to develop the wells cannot assure that no effect from drilling mud will remain within the aquifer, even after "clear water" pumping has been achieved. Absorption of uranium onto residual drilling mud would result in artificially low concentrations of the contaminant in sampled water. Therefore, an alternative drilling technique (e.g., cable tool) is recommended.

Careful soil sampling during drilling will provide the best information concerning zones of uranium accumulation. Continuous split-spoon sampling should be done instead of the 5-foot intervals proposed by the consultant, since the zone(s) of contaminant accumulation could be thin, discontinuous and variable in-depth depending on local conditions. These samples should be analyzed for any and all contaminants that may have been used or disposed within the FMPC site.

Permeability testing is proposed as a way to predict flow velocities and aquifer yields. However, only disturbed (split-spoon) samples will be available on which to run tests. Considering the importance of identifying flow pathways available through joints and fractures in the clay and/or relatively thin lenses of sand in an area, relatively undisturbed Shelby tube samples are recommended for laboratory permeability tests. Dames and Moore should propose drilling a number of test holes to obtain Shelby tube samples of representative subsurface materials.

Well construction details appear adequate as proposed, except that the well annulus should be cement grouted from the bentonite seal to the surface using a tremie pipe instead of backfilling as indicated.

To prevent possible contamination by the sampling equipment, stainless or teflon well casings should be used rather than PVC when obtaining sediment and groundwater samples.

Sample collection is equally important in assuring accurate results. Field preservation (with HNO_3) of turbid samples could release some previously insoluble uranium oxides adhering to clay particles and result in higher analysis results. Care should be taken to assure that clear water samples are taken, or that they are field filtered prior to preservation.

D. WELL DISTRIBUTION

For uranium oxide, a major goal of monitoring should be to establish the pattern of accumulation in the subsurface soil and water and to delineate the affected area. Shallow, intermediate, and deep sampling monitoring zones should be able to define the zone of leaching, the zone of accumulation and the unaltered zone. These three horizons should be identified by a sufficient number of carefully spaced wells. These wells would produce a profile which would show zone thickness, depth and areal extent. Although well distribution should reflect groundwater flow patterns, the site as a whole should be monitored to assess the effect of air-transported contaminants. The 5 cluster wells and 3 lysimeter installations proposed by Dames and Moore appear adequate to develop a preliminary profile, but a more detailed analysis will probably be needed.

The Dames and Moore Ground Water Monitoring Plan does not provide for continuous groundwater monitoring. An adequate monitoring program that complies with 40 CFR 265 Subpart F should be implemented. It appears that wells 18s and 18d are too far downgradient from the waste pits, and wells 19s and 19d may also be located too far from the waste pits. Off-site wells should be sampled, upgradient wells designated, and the aquifer being used for upgradient sampling identified.

The proposed groundwater monitoring system can be considered only a first-step effort toward an adequate groundwater monitoring system under the interim status standards of RCRA. Until the actual groundwater flow patterns are established at the site and it is determined what effects the production wells have on these flow patterns, the acceptability of the system cannot be adequately evaluated. Additionally, the DOE should determine how many RCRA regulated units there are at the facility. For example, if only one waste pit is considered RCRA regulated, there may not be as many wells needed as if all five pits are considered regulated.

4. CONTAMINATION OF DRINKING WATER SUPPLIES

It is suggested that DOE re-sample previously sampled private wells and any other drinking water wells in the immediate vicinity. Any drinking water wells showing above-background levels of contamination should be placed on a schedule of continued monitoring to determine if levels are increasing. If any drinking water systems are found to have contamination exceeding current maximum contaminant levels (MCL's) or health advisories, action will have to be taken to provide treatment or an alternate water source. The Ohio Environmental Protection Agency (OEPA), Division of Public Water Supply, should be kept informed of the results of all sampling of drinking water sources. Also, the sources for any increases noted in drinking water contamination levels would need to be identified and mitigated. There should be no detectable impact on drinking water quality because of the operation of FMPC.

5. NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT MONITORING REQUIREMENTS

A. PRESENT NPDES PERMIT

The existing National Pollutant Discharge Elimination System (NPDES) permit for the Fernald, Ohio, facility was issued on October 2, 1980, and expired February 1, 1985. Under Ohio State Law, a permit cannot be reissued unless the permittee is in compliance with the previously issued permit. Regardless of the action taken by the State, the DOE should achieve compliance with the final effluent limitations in the existing permit as expeditiously as practicable.

A compliance schedule was included in the permit that required the FMPC to install a biodenitrification facility and to divert coal pile runoff such that it enters the General Sump system. Construction was to be completed by April 1, 1984, an operational level was to be attained by June 30, 1984, and final effluent limits became effective July 1, 1984. However, the facility was never constructed and; therefore, FMPC is not in compliance with the final effluent limits.

OEPA referred FMPC to the State Attorney General for enforcement litigaion based on non-compliance with the above-mentioned schedule, and for violation of certain final effluent limitations that were to be achieved as a result of modifications required in the compliance schedule.

B. Permit Renewal

A review of the NPDES permit renewal application submitted to the Ohio EPA Southwest District on September 20, 1984, indicated that Form 2C data for in-plant Outfalls 001A, 001B, 001C, and 001D would be submitted at a later date. In addition to requirements for reporting quantitative data for the Organic Priority Pollutants at these in-plant outfalls, it is strongly recommended that any other substances indicated to be present in the extracts by peaks on the reconstructed gas chromatograms (total ion plots) more than 10 times higher than the adjacent peak-to-peak background noise should also be reported. Identification of these substances should be by reference to the EPA/NIH computerized library of mass spectra, with visual confirmation by an experienced analyst. Quantification may be an order-of-magnitude estimate based upon comparison with an internal standard. Furthermore, the average concentrations, and concentration

> ranges for uranium should be reported for the in-plant outfalls, as was done for Outfalls 001 and 002 in the first portion of the permit renewal application.
>
> In the September 26, 1984, Draft Task A Report-NLO Ground Water Study, strong evidence was provided which indicates that waters discharged to the storm sewer ditch (Outfall 002) may be a primary source of the above background concentrations of uranium in offsite groundwater. Furthermore, untreated storm water runoff discharged from Outfall 002 may be toxic to endemic aquatic life in the low-flow receiving stream (Paddy's Run Creek). Consequently, it is recommended that the permittee conduct a cost/benefit study to determine whether it is technically, feasibly, and economically reasonable to upgrade the capacity of the storm sewer lift station such that all of the storm water can be diverted to the General Sump area for additional treatment and subsequent discharge to the Great Miami River.

Mr. GUIMOND. EPA discussed its concerns and comments at a meeting with DOE on April 2, 1985. We anticipate a written response from DOE on the concerns of the letter and the issues discussed at the meeting.

Routine emissions to air from the FMPC consist primarily of slightly enriched uranium particulate matter discharged from vents on the roof of buildings within the facility's boundaries. Most of these emissions come from the uranium tetraflouride production and repackaging in plant No. 4 and metal production and slag grinding operations in plant No. 5. The vents are equipped with bag filters that remove the largest particulates; however, uranium particulates of respirable size may escape into the atmosphere. These particulates can be transported long distances by prevailing winds.

The amount of uranium emitted to the air per year is measured by the plant operator by placing probes in the various stacks and sampling a small fraction of the effluent. Most of the emissions are uranium-238 and uranium-234 in approximately equal amounts with a small additional amount of uranium-235.

Based on emission information provided by the Department of Energy, EPA uses mathematical models to predict the airborne concentrations of uranium as a function of location in the environment. Once the concentration value is known, additional models are used to estimate radiation doses and health risks using procedures recommended by the International Commission on Radiation Protection and the National Academy of Sciences.

This procedure is illustrated in the calculations made for the FMPC in support of the agency's standard for radionuclide emissions. It should be noted that more specific input parameters for individual facilities, such as FMPC, may alter dose estimates. In 1981, emissions from FMPC were approximately 0.11 curies of uranium-238 and 0.11 curies of uranium-234. To simplify our calculation, all releases were assumed to originate from a 10-meter stack at the center of the production area. One-third of the uranium was assumed to be in a chemical form that is insoluble in lung fluids and, therefore, remains in the lungs for long periods. The remaining uranium was assumed to be removed from the body within days or weeks. The actual solubility of the uranium compound emitted from the FMPC facility is not well known. If more of the uranium is insoluble, the resulting doses would be higher. Conversely, if more soluble, the dose would be lower.

The estimated annual radiation doses for 1981 to the major organs of nearby individuals assumed to be about a half mile northeast of the plant are: Pulmonary lung, 88 millirems per year; bone, 25 millirems per year; kidney, 12 millirems per year; and bone marrow, 2 millirems per year.

If one assumes that these individuals are exposed to these levels for 70 years, an increased risk of developing a fatal cancer is about one chance in 10,000.

To provide some perspective for these doses from the facility, average background in the State of Ohio is about 115 millirems. One chest x ray gives a skin dose of about 20 millirems and a bone marrow dose of about 2 millirems.

Your staff provided us with historical emission data for the FMPC plant for the years 1953 to 1984. Using this data, we provided you an estimate of the resulting lung doses for each year. This was done by applying a ratio of 1981 doses to 1981 emissions to the emissions of a given year. This is an approximate procedure because many of the factors upon which the calculation is based may change with time, including meteorological conditions, stack configuration, and others. Nevertheless, it is likely that the doses received by individuals living near the facility between 1954 and 1974 are considerably higher than at present and may have resulted in deposition of uranium in the environment around the facility.

The last item I would like to mention is the legislation on mixed waste developed by Senator Glenn and Congressman Luken. We have not completed an agency review of this proposed legislation. And because of the complexity of the mixed waste issue, we will need additional time to review the bills, and submit those comments later.

Thank you very much. I will be pleased to respond to any questions that you may have.

Senator COCHRAN. Thank you, Mr. Guimond, for your testimony.

Before we go to questions, let's hear now from the other member of the panel, Philip Bierbaum of the National Institute for Occupational Safety and Health.

Mr. Bierbaum.

Mr. BIERBAUM. Mr. Chairman, Senator Glenn, I am Philip Bierbaum, Deputy Director of NIOSH's Division of Surveillance, Hazard Evaluations, and Field Studies.

With me today is Dr. James Melius, on my left here, who is Chief of our Hazard Evaluations and Technical Assistance Branch.

We are pleased to appear before this committee to discuss NIOSH activities relating to the health and safety of workers employed at nuclear facilities.

In comparison with the number of epidemiologic studies we have conducted over the years in other areas of American industry, our experience with nuclear facilities has been minimal. We have conducted only 3 major studies involving Federal operations: an evaluation currently in progress of the Feed Materials Production Center here in Fernald, OH; a study of radiation exposures at the

Goodyear Atomic Corp. in Piketon, OH; a study of deaths from cancer at the Portsmouth Naval Shipyard in Kittery, ME, which is a naval nuclear facility.

NIOSH is mandated to conduct epidemiologic field research in general industry through the Occupational Safety and Health Act and in mining operations through the Federal Mine Safety and Health Act. These acts provide us with the right-of-entry into general industry and into mines. However, a very important point, these acts do not provide right-of-entry into Federal facilities or into facilities operated by Federal contractors unless we have the cooperation of the agency in charge. Our responsibilities for Federal facilities are outlined in an Executive order. Requests for our assistance to evaluate potential problems at these facilities can come from an agency, from employees or their representatives, or as an agency/employee joint request.

For the three studies we are discussing today, the requests for our involvement all came from the unions representing workers at the facilities.

I will discuss first, and in more detail, our experiences at the NLO facility here in Fernald, since that's the major focus of this hearing.

First of all, I will cover our overall evaluation at that facility. In February 1983, NIOSH received a request to conduct a general health hazard evaluation of workers at NLO. The International Association of Machinists & Aerospace Workers, one of the 14 separate unions comprising the Atomic Trades and Labor Council at NLO submitted this request.

From February through March 1983, NIOSH investigators contacted representatives of the unions, NLO, and DOE to obtain background information about the plant operations, to obtain more information on the nature of employee concerns, and to arrange with DOE for a visit to the facility.

In October 1983, NIOSH investigators visited NLO and conducted a walk-through inspection of the facilities. Discussions at that time led NIOSH to request copies of all available NLO health and safety reports, and to request access to NLO medical and environmental records to help us determine how to proceed. Not until January of 1984 did we receive 16 published and internal reports from DOE. DOE did not release access to personnel exposure and medical records to NIOSH because these records are maintained under the authority of the Privacy Act of 1974. DOE's "routine use" regulations under that act had to be amended before access to these records could be granted to us.

DOE proposed giving NIOSH access to these records in an amendment to their regulations in November of 1984. The notice of the final DOE decision to grant NIOSH access to these records was published in the Federal Register in February of 1985 and became effective March 25 of this year.

On March 14, 1985, NIOSH medical investigators met with DOE, the unions, and the NLO representatives at the facility. The unions at that time presented more information and a comprehensive list of health and safety issues that they wanted NIOSH to evaluate, as was presented in the unions' testimony this morning.

NIOSH investigators then reviewed, at the plant, the medical and exposure record systems that we now had access to, and we requested additional information from DOE. Most importantly, we requested the individually identified urine uranium monitoring results from all workers for several selected years. As of this hearing, we have not received all that information.

When we receive this information, we plan to analyze the urine uranium data to determine the extent of exposure to uranium and to determine whether workers in certain areas of the plant have substantially higher or lower exposures than the work force as a whole. We also plan to evaluate the effects of uranium exposure on kidneys, because we've done other studies and there is some concern about uranium exposures and kidney dysfunction. We also plan to evaluate the problems with lungs. As was mentioned in the unions' testimony, there have been various reports about this problem.

With regard to a second issue that we're evaluating at the plant that had a lot of coverage this morning are the plant 9 uranium releases and what they mean to the individual workers.

In December of 1984, NIOSH received an additional request from the NLO unions to assess the potential health effects to workers of uranium releases recently reported in plant 9 operations. The major issue here is to determine whether or not workers have internal body burdens of uranium in excess of the maximum permissible amounts as a result of exposure.

To address this issue, NIOSH investigators met again with representatives of DOE, NLO and the unions on December 17. Based on a review of the information available, NIOSH recommended that all potentially exposed plant 9 workers undergo bioassay testing to determine lung burdens of uranium, using the DOE in vivo mobile counter. This was recommended because the counter was readily available at the time and we would be able to address the question concerning internal radiation burden.

On January 11, 1985, NIOSH recommended lung burden counting on four workers by a second laboratory, Argonne National Laboratory, for a comparison with the DOE mobile counter results. Results from this laboratory differed from the results from the DOE mobile counter. NIOSH cannot resolve the apparent discrepancies with the present data.

Therefore, to further evaluate whether or not workers have absorbed excessive amounts of radiation, we recommended to the company and the unions that additional testing be conducted by the Battelle Pacific Northwest Laboratory. The in vivo system at that laboratory offers significantly better capabilities than the previous two counters used.

On March 27, 1985, NIOSH met with NLO, DOE, and the workers to discuss the findings and make the above-mentioned recommendations. The workers and the unions are now determining whether they will participate in this additional testing.

I will now go into our experiences in the other two nuclear facilities that we've been involved with. I will not go into a lot of detail here, but we want to present this, as requested by Senator Glenn, to show a comparison for some of our other studies.

In 1979, the Oil Chemical & Atomic Workers, which represent the work force at the Goodyear Atomic Corp. in Piketon, OH, requested that NIOSH evaluate occupational exposures and their effect on the health of workers at this plant. OCAW, the union, was concerned primarily about exposure to radiation from uranium hexefluoride, which is enriched to 98-percent uranium-235 at this plant. They were concerned that these exposures may have produced excess cancer among the workers.

There was, again, in this situation, quite a lengthy delay in NIOSH being able to initiate the study because DOE initially believed it would handle the evaluation—as you recall, we do not have right-of-entry on our own—and because NIOSH staff had to obtain the proper security clearances. Once these issues were resolved, a two-part study was undertaken by NIOSH; an industrial hygiene study to evaluate occupational exposure levels to radiation and other agents, and an epidemiologic study to determine whether the workers at the plant had experienced any excess mortality, particularly from cancer.

The industrial hygiene survey consisted of three parts. A qualitative assessment was conducted of chemical and physical agents—in this case, for physical agents, we're talking about mainly radiation—to which workers may be potentially exposed.

A quantitative assessment was conducted of surface alpha radiation activity at selected sampling sites in six of the production buildings.

A statistical analysis is being conducted of environmental/bioassay data collected by GAT. We're doing an analysis there like we will do at the facility here at Fernald.

For the data that we have collected from the industrial hygiene survey, we expect to have a report completed and available to the company and to the unions late this year.

The epidemiologic study was a retrospective cohort mortality study, where we determine the number of deaths from specific causes among the workers at the plant and compare them to similar rates—national rates. In this study, we will attempt to address specific hypotheses based on the exposures at the plant. For example, is exposure to radiation from enriched uranium associated with excess mortality from lymphatic cancer?

The historic data collected by the Goodyear Atomic Corp., the urinalysis data, and the data that we collect in our industrial hygiene study will be used with the mortality results to determine if there is an association with specific exposures and iobs at that plant.

We anticipate that the epidemiologic study will be available sometime this summer.

In regard to our activities at the Portsmouth Naval Nuclear Shipyard in Kittery, ME, how we got involved with that and what we did is as follows.

In May 1978, a Boston hematologist reported a fivefold increase in proportionate mortality from leukemia and a twofold increase from all cancer among workers employed in the maintenance of nuclear submarines at the Portsmouth Naval Shipyard.

At Portsmouth, 10 nuclear submarines were built between 1956 and 1971, and between 1959 and 1978, when we initiated our study, they had overhauled 60 nuclear submarines.

After being alerted to the reports of the Boston hematologist by Portsmouth Naval Shipyard union representatives, the predecessor of the Subcommittee on Health and the Environment of the Committee on Energy and Commerce in the House of Representatives, requested that the Department of Health and Human Services, subsequently NIOSH, investigate this potential problem. NIOSH conducted this investigation by performing, just like we did at Goodyear Atomic Corp., an evaluation of the Radiological Control Program. We also conducted a retrospective-cohort mortality study of all shipyard workers, and we conducted some backup case control studies.

In essence, all studies that we have done on Portsmouth are completed. I'll just give you a brief overview of what we found there.

Concerning our evaluation of the Radiological Control Program, this program started at Portsmouth in approximately 1958, because of the naval nuclear propulsion work there.

The first extensive radiological control work for occupational radiation exposure was that associated with the overhaul and refueling of the U.S.S. *Nautilus*, beginning in June 1959. This is the date that is generally considered the start of nuclear work at Portsmouth.

The Navy policy for ionizing radiation, as has been mentioned so many times this morning, has always been the radiation dose to the worker to a level as low as reasonably achievable. In setting dose limits, the Navy relied on the recommendations of national and international standards organizations for guidance.

When we evaluated the Radiological Control Program, we looked at 5 areas:

Were the dose data they provided us adequate to conduct our mortality study?

Was the Radiological Control Program effective in protecting the worker from radiation hazards?

Did accidents or incidents occur which resulted in exposure of the worker to external or internal radiation sources?

Were there any unreported accidents or undocumented exposures?

And as a logical progression of that investigation for the workers, had there been any nuclear work at Portsmouth that had an effect on the surrounding environment?

For this specific case, the Navy nuclear work there, we found that the radiation control program was effective in protecting the worker, the environment, and the general public.

We did not answer the question of whether or not certain radiation levels were safe or not.

We found that the Radiation Control Program they had was very effective.

In regards to the cohort mortality study, the objectives of the study were to determine whether any excess cause-specific mortality existed, particularly those causes of death; mainly, leukemia and all cancers, as had been reported by the Boston hematologist; and to determine whether a dose-response relationship exists between radiation dose and specific mortality from any cause.

In our analysis, we concluded that excess deaths due to malignant neoplasms and specifically to neoplasms of the blood and blood-forming tissue were not evident in civilian workers at Portsmouth.

We informed the Navy and the union of these results, and published our data in Lancet in 1981.

We have conducted two followup mortality case-control studies that are reported in the testimony. I won't go into those today, because there aren't any startling results there.

That concludes my formal comments. Dr. Melius and I will be glad to answer any questions.

Senator COCHRAN. Thank you very much, Mr. Bierbaum. We appreciate your testimony.

Mr. Guimond, in your testimony, you mentioned that there are certain restrictions on EPA's ability to issue regulations under certain Federal statutes, but you pointed out that under one statute, at least, the Agency has the authority to advise the President and issue guidance to all Federal agencies with respect to radiation matters.

In connection with that, let me ask you, what guidance, if any, has EPA, under that authority, issued to the Department of Energy with respect to radiation matters at this Fernald facility?

Mr. GUIMOND. At present, we haven't issued any that is related to DOE at this facility. As I mentioned, we're currently in the process of—let me go back a little bit. In 1960, a predecessor of the EPA, an organization called the Federal Radiation Council, formulated standards for the general population and for occupational workers. Those standards, which were formulated in 1960, or recommendations currently are badly outdated. So, we have embarked on a new project to revise those and bring them up to the current scientific information. Those, we expect to have finalized some time this year, in the next few months, and those would be recommendations that we would, then, issue to all Federal agencies, to be ultimately implemented within their own regulations or operating guidelines, and that would include DOE.

So, subsequently, the way that they control their occupational exposures at the Fernald facility, as well as other facilities, would come under the purview of those new guidelines.

Senator COCHRAN. There was testimony earlier today that the Department of Energy intends to start up the plant on May 1. In fact, these plants have been shutdown. Had you contemplated issuing any advice under this authority to the Department of Energy with respect to whether or not there should be a startup again of those facilities, or whether there should not be?

Mr. GUIMOND. No, we have not.

Senator COCHRAN. In your judgment, with what you know about the emissions of uranium here at this facility, would there be any advice that you contemplate issuing with respect to the Department's refraining from starting up the operation of the facilities?

Mr. GUIMOND. No, there's no specific advice that we contemplate issuing along those lines. Clearly, we have our new air emission standards that we anticipate that they will comply with. And, as I previously stated, we are revising the new occupational exposures to be out later this year, and we expect them to be in compliance with those. If they come into compliance with these requirements, as well as any other associated requirements, we think that would be adequate.

Senator **Cochran**. Those regulations that you contemplate issuing have not yet been published or circulated for comment, I suppose.

Mr. **Guimond**. Actually, they have. Back in 1981, we put out proposed guidelines, and we received many comments from people. And, as a result of those comments, we've embarked on a major revision of the proposed guidelines. We've been undertaking the revision for approximately a year, and we've just about completed the final guidelines. We've given them to noted scientific groups for review, and it's now being circulated at the senior policy level among the 13 or so cooperating agencies. Subsequent to that review, we anticipate transmitting it to the President for his issuance.

Senator **Cochran**. I'm assuming—correct me if I'm wrong—that there has been consultation and discussion between Department representatives about these regulations, and the applicability of them, and whether or not compliance can be achieved. This would include DOE, Nuclear Regulatory Commission, as well as persons from your agency, EPA, is that correct?

Mr. **Guimond**. That's correct. We had participants on the group which included the Department of Energy, NRC, the Department of Defense, including the Department of Navy and the various other service groups, NASA, the Occupational Safety and Health Administration, Mine Safety and Health Administration, National Bureau of Standards. Any federal agency that has any purview over radiation matters has been consulted and participated in this review.

Senator **Cochran**. You gave us the benefit in your testimony of an analysis which you did in response to some information provided to you by the staff of this subcommittee. You were provided with some information about radiation doses and were asked to calculate the impact in millirems on the various organs of the body.

On page 12 of your testimony, you provided that information based on annual radiation dose for 1981 on major organs of nearby individuals, assumed to be located about a half a mile northeast of the release point on the site boundary.

Then in the next paragraph you mention that to provide some perspective to these doses, you cited the average background in the State of Ohio to be 115 millirems per year, but you did not break that down into the impact on major organs for a comparison.

Is there a way to compare those two things? It looks to me like you're comparing apples and oranges, and you're really having a hard time analyzing whether the average background is virtually the same for persons located a half a mile northeast of the release point or not.

Mr. **Guimond**. Well, the background number is basically a whole body number. You get your background radiation from things in the ground and cosmic rays. So, that's basically whole body. Whereas, material that you inhale or ingest generally go to different kinds of organs and it's not a whole body radiation. For the airborne release you primarily expose the lung.

Basically, single organ exposure of value X, if you will, has less health risk to you than whole body exposure to the same value. In other words, if you had your lung exposed at 100 millirems per year or whole body exposure at 100 millirems per year, there's less risk associated with just the lung exposure.

Does that help a little bit?

Senator COCHRAN. Well, let me ask you this question then, if I understand you. The average background in the State of Ohio is about 115 millirems. In all of the major organs you identified, the highest of all, pulmonary lung is 88 millirems. Did we get from that, then, there is less exposure in the area one-half mile northeast of the release point than there has been in the average background for the State of Ohio?

Mr. GUIMOND. Yes. The risk from exposure to that background radiation over an entire lifetime is roughly one in a thousand. The exposure to that extra 88 millirems to the lung, if you had that over your entire lifetime, would add about another 1 in 10,000 chances of getting lung cancer.

Senator COCHRAN. On the next page of your testimony, you mention that it's likely that the doses received by individuals living near the facility between 1954 and 1974 were considerably higher than at the present. From 1974 to 1984 is still a 10-year period, too. I wonder whether or not that statement would be the same, if we included the period, 1974 to 1984, is that the present that you're referring to?

Mr. GUIMOND. Well, if you look at the chart that we ran out for the committee and was attached to the press release by Senator Glenn, you can see from 1974 to the present, you're approximately the same, on the order of 50 to 100 millirems per year, generally. And the larger doses we calculated were before that.

We did make an estimate to get an idea of the potential risk recognizing the uncertainty with these calculations. If you assume that this release data are correct values, we calculated the risk to somebody near the plant for the period between 1953 through the present. The calculation and estimate that such a person would have an increased lifetime cancer risk of about one in a thousand.

Senator COCHRAN. Can you say, therefore, on the basis of your review of the evidence that there has been a sufficient release of uranium particles in the atmosphere at this facility to jeopardize the health of workers or area residents?

Mr. GUIMOND. Well, it's a difficult thing to say. We do not assume that there's a "safe" level of radiation exposure. For prudent practice we assume the amount of risk is generally proportional to the amount, of exposure someone receives.

Obviously, in the early days there appears to be some larger amounts of release of uranium which contributed to higher increased exposure and risks. Whether one wants to call one in a thousand risk safe or unsafe, I think, depends on whose making the judgement as to what is an acceptable level of risk for that particular situation. From the standpoint of the standards that EPA established for radionuclides, one in a thousand is a level that the agency has estimated in its risk estimates and concluded was suitable public health protection.

Senator **Cochran**. Now, Mr. Bierbaum, some differences detected in the test results in the screening done of workers to determine whether or not any had sustained any harmful effects as a result of uranium emissions at the plant, and that you had recommended that workers have additional tests done at a certain location, and I don't recall now the identity that you provided to us of the testing facility.

Then you said the union or the workers had under consideration whether or not they would comply with that recommendation. That's been, what, about 3 or 4 weeks period of time during which that's been under consideration?

Mr. **Bierbaum**. We received their response. I forget the exact date. It was a couple of weeks ago. The workers have a legitimate concern that the laboratory that we recommended for testing is a DOE contracted laboratory. We originally recommended that laboratory because it has the sophistication necessary to compare the results and it has the necessary sophistication to do the correct job. The workers have a legitimate concern. They've provided their recommendations back to us as to which laboratories, non-DOE laboratories, would be acceptable to them.

We are evaluating those laboratories. We've contacted several of them. Several of them are out of the country; one in London, one in Scotland, and so forth. So, there's some geographical problems there. But we are evaluating those facilities that they feel comfortable with, and we will work that out between DOE, us, and the unions so their concerns are alleviated as far as this problem.

Senator **Cochran**. Do you feel that progress is being made in working out some agreement on a testing facility so you can come up with an answer that will have credibility with all concerned?

Mr. **Bierbaum**. From that standpoint, our technical advisers tell me that there probably are other labs that are not DOE-affiliated that can do the job. We can only assume that, then, DOE will support sending the four workers to those facilities. That is not within our control. We can recommend it.

Senator **Cochran**. The number of workers at the facility is over 1,000; is that right?

Mr. **Bierbaum**. Yes. We only have a question now of the results of 4 individuals.

Senator **Cochran**. Yes. Senator Glenn.

Senator **Glenn**. Thank you very much, Mr. Chairman.

Mr. Guimond, I believe you proposed earlier this year or last year an EPA staff recommendation of 10 millirems per year for the whole body and 30 per year for any organ.

Mr. **Guimond**. Yes, we proposed such a standard.

Senator **Glenn**. But that's not in effect now, though?

Mr. **Guimond**. No.

Senator **Glenn**. It was not accepted, OK.

Is it literally possible to adhere to a standard that strict?

Mr. **Guimond**. We believe it was when we proposed it. The proposed standard which was issued in March 1983 was developed after we went through what we thought an analysis of what could be achieved at these various facilities. It's a number that reflects our estimate of as low as reasonably achievable levels at these type of facilities.

Senator GLENN. I was wondering, because as has been repeated here, Ohio has 115 millirems per year. Washington, DC, has, what, 85–90, something like that. And then you get out to Denver, it gets up around 160 or 70, something of that order, and an x ray is just twenty.

Mr. GUIMOND. Twenty skin.

Senator GLENN. Twenty skin, OK. But we're getting down to fairly low levels here, and I wonder if that's really achievable from a place like Fernald out here. Where they're working with radioactive material, do you think it's possible there to get the limits down to that kind of level?

Mr. GUIMOND. We had an engineering analysis performed for us in support of the proposed standard, and an engineering analysis was done by the Pacific & Northwest Lab, which is a DOE contractor, and they took a look at whether it was achievable. Their conclusion was that it was achievable with improvements in the control system, such as the HEPA filter and better controls over the baghouses.

However, the other conclusion probably is, too, that it doesn't leave one with very much room for operating flexibility. It means your systems have to work very good all the time, so that doesn't leave much room for consideration of whether you have day-to-day modification of procedures or operations.

Senator GLENN. The standards that did go into effect on February 17, or what, was that the 25——

Mr. GUIMOND. Yes, 25 whole body; 75 any organ.

Senator GLENN. Twenty-five/seventy-five, OK. And DOE is required to be in compliance as of, when, April 17?

Mr. GUIMOND. Actually, it's May 6. I had made an original error in the date I gave your staff. After I checked, the date is 90 days after we had published the rule in the Federal Register, and the rule was not in the Federal Register until February 6, so it's effective May 6.

Senator GLENN. May 6, OK.

Mr. GUIMOND. For DOE facilities.

Senator GLENN. Because I was going to ask you if they were in compliance on it, because, supposedly, if it was still April 17, they should have been in compliance 5 days ago. And the followup question was going to be if they have applied for a waiver if they're not in compliance.

Mr. GUIMOND. Well, we have not received any waiver applications from them, and, frankly, I don't know whether they're going to be in compliance or not.

Senator GLENN. You provided implementation guidelines to DOE and others as of this date?

Mr. GUIMOND. No, we have not. The rule that went out February, because of the haste at which we had to put it out, had some deficiencies; some of those which were measurement procedures, how to determine whether you're in compliance and all, and, quite frankly, we have not had the ability to get those developed yet. We've met with staff from DOE trying to discuss with them appropriate mechanisms for this, but, to date, we have not published guidelines.

Senator GLENN. OK. Does DOE have any department-wide procedures for determining compliances? How are they going to monitor this? Is that going to require new people and new equipment?

Mr. GUIMOND. Frankly, I think you need to ask DOE that question; how they're planning to handle this within their own staff organization. DOE has a headquarters environmental coordinating group, and environmental staff's at each individual facility and plant, and how they break their responsibilities down I'm not sure.

Senator GLENN. OK. In your letter to Mr. La Grone of, I believe, it was March 9, paragraph 3 of that is a rather harsh indictment of FMPC here. It says, and I quote, "U.S. EPA's review of the environmental impact associated with the ongoing operation of the FMPC has identified the following major concerns: one, radiation monitoring program is inadequate; two, there have been incidents of radioactive air emissions due to unsatisfactory operation and maintenance of control equipment; three, the ground water monotoring plans prepared by Dames & Moore for FMPC is inadequate; four, there is a possibility that individual noncommunity and community drinking water supplies have been contaminated; five, the national permit discharge elimination system in PDES permit monitoring requirements do not reflect the potential for discharge of radionuclides and other chemicals." And there are additional comments made on it.

Have you had any series of meetings to see what can be done about this? That's a very harsh indictment of how things are going.

Mr. GUIMOND. We have met with DOE, and I'll ask Mr. Bill Franz from our regional office to discuss those since he participated in them.

Mr. FRANZ. Thank you. We have met with them on April 2, about 3 weeks ago, to go over our letter and discuss some of our concerns.

What we have agreed to do is that the Department of Energy will provide written responses to our concerns and provide us also with a schedule for dealing with these concerns. This includes performing the environmental review and gathering of data that they will be doing over the next several months. These activities are designated to give us an idea of what's happening at the facility.

Senator GLENN. Well, I hope you're keeping in close touch with them, because you've given an independent analysis of it, and it's analysis that shows there is still a lot wanting out there and that still has to be done. And, so, I hope you're working very closely together with them on it.

What is the delay in implementing some of these things and getting out the compliance standards that I mentioned a moment ago?

Mr. GUIMOND. Well, the radiation office is a relatively small program in EPA, and we've been simultaneously working on a couple of court orders to get other standards out under the Clean Air Act. And, quite frankly, it's just our inability to get to this.

Senator GLENN. Just need more people?

Mr. GUIMOND. Either more people, time, or more some other way of being able to get to do the job.

Senator GLENN. Can't give you more time. I can't stretch the clock. In these days of budgetary constraints, where do you stand on budget and on personnel problems? Have you been whacked back?

Mr. GUIMOND. The radiation program staff has been reduced over the past, say, 5 or so years. We're at about a comparable level this year and next year to what we were of, say, last year. From our current standpoint it's a case of trying to get the planning done for the implementation program and ultimately get it into the budget requests and get it factored into future programming so we can get something done.

Senator GLENN. Well, have your budget and personnel actually been cut? You said 5 years. Have they actually been cut over this last 5 years?

Mr. GUIMOND. Well, if you take a look at the budget between 1980 and the present, there's a decrease between that period of time, yes.

Senator GLENN. Decrease?

Mr. GUIMOND. Yes.

Senator GLENN. What percent overall? The problem is increasing. I hate to see you decreased.

Mr. GUIMOND. I'd have to get you the exact data between there, but I believe our staff in 1980 was approximately 200 people, and currently on the order of 130 or so. And in the 1980 extramural budget was on the order of a little over $7 million, and it's currently about 2.

Senator GLENN. In this area, you've been reduced by about a third, then, on your overall staffing to take on problems like this are affecting the health of the people of the country.

Mr. GUIMOND. From the standpoint of the overall staff effort of the radiation program, it has been decreased over that period of time, yes.

Senator GLENN. Well, I think that's false economy, and I know we have budget problems, but, I swear, I just think we increase our requirement for Medicaid and Medicare, and health problems on down the road, and I think there's some areas where it's a tragedy to see the budget whacked back, and that's one of them.

In the NLO testimony they say the resulting concentrations of uranium in the air at the plant boundary were always well within the DOE guidelines for uncontrolled areas. They also said that seldom has the yearly average airborne uranium concentration measured at the boundary exceeded one-half of 1 percent of the DOE limit. And the average has never exceeded 17.7 percent of the limit. And, finally, they say all calculations of population doses from airborne uranium show that the doses were only a small percentage of the DOE limit for population exposures.

In your view and from what you know about the situation out here, how well would NLO have known what was at the boundary?

Mr. GUIMOND. It's hard for me to say what they would have known. I don't know what their monitoring capabilities are. Those figures that you have from NLO, I'd have to know more about the specific data to be able to comment on the percentage you've quoted.

Senator **Glenn**. Well, they had their monitors out there, and what I'm asking is whether you feel they were adequate, and, of course, EPA did a careful calculation in 1981 regarding dose rates at the boundary, so you had to base it, I guess, on their monitoring system.

Mr. **Guimond**. Yes, except that, I think, they're probably referring to some monitors they set up in the environment, at some various places in the environment, and our calculations were based on not on dose, but on the actual emissions from the plant stacks. Then we use certain kinds of mathematical models which consider the local meteorology and various other factors. This enables us to estimate the radiation dose in various places all around the facility. It sounds like what you're describing is that they are referring to data from some monitoring stations in a few places. Not knowing where they were and exactly how they were sampling the air and what they were analyzing, it's hard for me to comment on their statement.

Senator **Glenn**. Wasn't monitoring data from NLO monitors utilized in your 1981——

Mr. **Guimond**. No, it was not.

Senator **Glenn**. Oh, it was not. You did an independent study then of that with independent monitoring?

Mr. **Guimond**. I think you're referring to two different things. The data that we get from them and that was provided to us from your staff, which is basically the amount of uranium going out their various stacks, and——

Senator **Glenn**. Dr. White just said your study was based on stack emissions.

Mr. **Guimond**. Yes, that's correct.

Senator **Glenn**. An NLO's study was based on monitors out around the perimeter.

Mr. **Guimond**. Some kind of environmental sampling, which I haven't reviewed, and I can't compare their work and ours unless I'm able to put the data together.

Senator **Glenn**. OK. Mr. Bierbaum, what's been your experience in obtaining entry to federally contracted facilities, and what's been your experience with NLO out here?

Mr. **Bierbaum**. Well, like I said in the testimony, we've only had experience, major experiences, with two DOE contractor facilities; Piketon and NLO here. As with any Federal facility, like I mentioned, we don't have right-of-entry, OK. So, we do have to negotiate our way in. I would say that our ability to do these studies, both at Piketon, in this case, Piketon and Fernald, probably took longer than it should have for us to have the actual entry into the facility and have access to the necessary data.

Senator **Glenn**. What's the hesitancy? Is it based on security; the fact that they're defense plants?

Mr. **Bierbaum**. Well, in the case of Piketon, the people that we needed to get into the facility did not have the proper clearances, so that took longer than normal. But, normally, when we go into a Federal facility, and specifically the two that we're talking about here, they would prefer that they try to do the evaluations themselves. Therefore, their initial agreement to having us in there, because they are union requests, are not always that positive.

Senator **Glenn**. Is urinalysis the best way to check on how much radiation a person has received?

Mr. **Bierbaum**. Well, for certain types of exposures, yes; other types, the whole body count system.

Senator **Glenn**. Whole body count requires a whole chamber and so on, doesn't it? Isn't that a much more extensive operation than just the urinalysis?

Mr. **Bierbaum**. Right. Urinalysis is what is going to help to evaluate the amount of uranium exposure they've had, and also effects on kidney dysfunctions and so forth.

Senator **Glenn**. How long is it valid? How long after radiation can you still make a urine check and urinalysis and have any validity to the check?

Mr. **Bierbaum**. I have to defer to Dr. Melius, a physician.

Dr. **Melius**. It's mostly an immediate check, so it would deal mostly with recent exposures for that individual. Now, other checks that one would do—for example, medical testing—would show any effects over a longer period of time. So, other medical testing that would be done would, in some sense, monitor their exposure over a longer period of time.

Senator **Glenn**. Is it a difficult check to run? In other words, if you had people in a high-risk environment, are they checked every day?

Dr. **Melius**. It can be run frequently. It's not an extremely difficult test to do, if one is setup to do it properly and routinely.

Senator **Glenn**. If a person was exposed today—let's say I receive radiation today. Would that show up in urine over, what, just until tonight, or tomorrow, or a month, or what?

Dr. **Melius**. If you were exposed to soluble uranium, which is what one is monitoring through these tests, that would show up within a short period of time in urine. It would be excreted. So, one would pick up relatively recent exposures to uranium through that monitoring and would detect if one was over-exposed on that basis.

Senator **Glenn**. There was some disagreement in some of the data out here also. What's your explanation, Mr. Bierbaum, of the difference between the results from the independent laboratory and the results from the DOE mobile counter regarding the measurement of lung burden on four workers at FMPC?

Mr. **Bierbaum**. Well, the difference was purely one where the Argonne National Laboratory counter and the DOE counter did not give us the proper resolution that we really wanted. And because there was a difference in the counters and so forth, there was a discrepancy in the results. What we're planning there is to try to go to a better laboratory with more sophisticated counting procedures.

Senator **Glenn**. There have been a number of requests by the International Chemical Workers Union—one of them was July 11, 1980, and I think there have been two or three others through the years that I was shown by staff a little while ago here—to have NIOSH do a health hazard evaluation at FMPC. Why did it take so long for an evaluation to get going?

Mr. **Bierbaum**. I will defer this to Jim, but my information is that there are formal requests that came to us in 1983, and we may have had other investigations at that facility. One of the reasons it did take us so long, when we got this latest request, was the ability—the initial right-of-entry problems, getting access to the records, and so forth. That's what has delayed us.

Jim, are you familiar with this?

Dr. MELIUS. Yes. We received an initial request in 1980 that I'm aware of from the local International Chemical Workers Union. Because of the known problems we've had with other Federal facilities, we replied with a request to obtain further information on their concerns and did not receive any followup information from the requestor; therefore, we did not followup on that request.

Senator GLENN. You mean after they made their request they wouldn't give you any other information on it or what?

Dr. MELIUS. Correct.

Senator GLENN. Because the original request was made July 11, 1980.

Dr. MELIUS. Right. And we received a followup request in 1983, as is outlined in our testimony, and the delay there—some of the initial delay was trying to pinpoint what were the major concerns of the unions at that facility so we could direct our evaluation in the best manner possible.

Senator GLENN. Let me just make a little closing statement while this panel is all still here, but it's for everyone else here, too, and it's something I think is rather important.

One of the reasons we want to clean up Fernald is that we don't want to see people in Hamilton and Butler Counties, and other areas here, have the additional cancer risk they're already experiencing. And this is the important part. I have been informed by the National Cancer Institute that Hamilton County has one of the highest cancer rates in the Nation. I've asked for more detailed data, and they've told me it will be forthcoming shortly.

I don't want to say that Fernald is causing this high cancer state, because I believe it is not The basic cause of it; I'll put it that way. But, certainly, we don't want emissions from Fernald to be adding to this natural background radiation and things like that which might create a problem.

But with Hamilton County having one of the highest cancer rates in the Nation already, I think it behooves us to say the cleanup at Fernald must get a priority. It's more than necessary. It's an absolute necessity right now. And I'm not saying that FMPC is the cause of it, but it shouldn't be allowed to add to that cancer burden. So, that's one of the important things about the whole hearing today.

Thank you, Mr. Chairman.

Senator COCHRAN. Thank you, Senator.

I want to express the appreciation of the committee to the members of this panel. Your cooperation with us and your attendance at the hearing have been very helpful to us. And we thank you for being here.

[The prepared statements of Messrs. Guimond (with attachments) and Bierbaum follow:]

Statement of Richard J. Guimond
Director, Criteria and Standards Division
Office of Radiation Programs
U.S. Environmental Protection Agency

before the

Subcommittee on Energy, Nuclear Proliferation, and Government Processes
Senate Governmental Affairs Committee
at Cincinnati, Ohio

April 22, 1985

Mister Chairman and Members of the Committee: I am Richard Guimond, Director of the Criteria and Standards Division in the Office of Radiation Programs, U.S. Environmental Protection Agency. I am responsible for directing the Agency's regulatory environmental radiation protection program, including development of standards for the disposal of high-level and low-level radioactive wastes, and the control of radioactive air emissions. I also have with me today Mr. Ken Shuster, Chief of the Land Disposal Branch in EPA's Office of Solid Waste and Emergency Response and Mr. Bill Franz, Chief of the Environmental Review Branch in EPA's Region V office in Chicago. I appreciate the opportunity to discuss EPA's role in regulating hazardous pollutants from Department of Energy (DOE) facilities. You requested that the Agency's remarks address several areas including EPA's statutory authorities and regulations, the risks associated with the releases at DOE's Feed Materials Production Center (FMPC), the relationship of EPA with the State of Ohio in environmental protection activities concerning the FMPC, and coordination with the new Office of Science and Technology's policy committee on radiation issues.

My statement covers these areas in various degrees of detail. If you would like additional information, we can try to provide it during the questioning period or furnish written responses for the record.

EPA Authorities

I would first like to discuss generally the Agency's statutory responsibilities applicable to the management of hazardous pollutants at DOE facilities. Executive Order 12088 established the Executive Branch program that requires Federal agencies to comply with appropriate environmental statutes and regulations. Each Federal agency is responsible for ensuring that facilities under its jurisdiction comply with applicable Federal, State and local environmental standards and procedural requirements, and develop schedules for compliance and budget whatever funds are necessary to bring its facilities into compliance. To carry out its responsibilities under the Executive Order, EPA has established its Federal Facilities Compliance Program. The goal of the program is to bring Federal facilities into compliance with applicable pollution control standards through cooperative efforts among the affected agencies. EPA has the responsibility to ensure that the intent of the program is met and provide necessary technical advice and assistance, conduct reviews and inspections, and resolve disputes between Federal agencies, EPA, and States regarding noncompliance by Federal facilities.

In addition to the oversight role provided by Executive Order 12088, EPA implements several environmental laws which affect the activities of DOE facilities. These include the Clean Air Act, the Resource Conservation and Recovery Act, the Clean Water Act, the Safe Drinking Water Act, the Comprehensive Emergency Response, Compensation and Liability Act, and the Atomic Energy Act.

The Clean Air Act, as amended in 1977, provides the Agency several avenues for regulating air pollution. Prior to this year, only nonradioactive air emissions from DOE facilities were subject to the Agency's New Source Performance Standards, National Ambient Air Quality Standards, and National Emission Standards for Hazardous Air Pollutants. However, the Agency recently promulgated a standard to limit radionuclide emissions to air from these facilities. I will discuss the details of this standard and our approach to implementing it a little later on.

Under the Resource Conservation and Recovery Act (RCRA) of 1976, as amended, EPA is responsible for regulating hazardous wastes, including those at DOE facilities. However, RCRA excludes from EPA jurisdiction "source, special nuclear, or byproduct material as defined by the Atomic Energy Act (AEA) of 1954, as amended." The implementation of the RCRA and AEA authorities is complicated by the question of wastes that present both radioactive and nonradioactive hazards. This will also be discussed in more detail later.

The Clean Water Act requires that EPA limit the discharge of hazardous pollutants into the nation's waterways. Under this Act, the Administrator, or a State that has been delegated authority to implement the Act, must issue a permit for the discharge of any pollutant from any facility, including those owned by the Department of Energy. National Pollutant Discharge Elimination System (NPDES) permits do not apply to the discharge of source, special nuclear, and byproduct materials. These materials are regulated under the Atomic Energy Act.

As the Clean Water Act protects the nation's navigable waters, the Safe Drinking Water Act protects the water which the public ingests.

Public and community water systems are covered by regulations promulgated under this Act and maximum concentration limits (MCLs) in drinking water have been established for a number of hazardous pollutants. MCLs have not yet been promulgated for uranium and radon, but they are being considered for inclusion in the revised primary drinking water regulations.

The Agency also has the authority to advise the President and issue guidance to all Federal agencies with respect to radiation matters. This authority is derived from the Atomic Energy Act. Under this authority, the Agency, in cooperation with several agencies, including DOE, is currently revising guidelines for occupational exposures. These guidelines will be applicable to DOE facilities.

Radionuclide Air Emission Standards

I would now like to address in more detail some of the Agency's primary statutory responsibilities applicable to DOE facilities. First, the Clean Air Act. I am only going to discuss the Agency's recently promulgated rule limiting radionuclide emissions to air from DOE facilities, since that standard has the most relevance in today's hearing. On January 17, 1985, EPA promulgated emission standards under Section 112 of the Clean Air Act for DOE facilities, NRC-licensed facilities and non-DOE Federal facilities, and elemental phosphorus plants. These standards were promulgated in response to an order from the U.S. District Court for the Northern District of California which directed EPA to either promulgate final standards for these source categories or determine that radionuclides are clearly not a hazardous air pollutant. To fully understand the rationale for the standards issued on January 17, it is necessary to explain some of the extensive technical and legal proceedings prior to the promulgation.

The 1977 amendments to the Clean Air Act required EPA to consider whether radionuclides constituted a hazardous air pollutant under the provisions of the Act. After extensive litigation and rulemaking proceedings, Administrator Ruckelshaus thoroughly considered the available technical information and decided to withdraw the proposed standards on October 23, 1984. For three categories (DOE facilities, NRC-licensed and non-DOE facilities, and elemental phosphorus plants), he concluded that current practice provided an ample margin of safety in protecting the public health from the hazards resulting from exposure to radionuclides from these sources. With no further control of these facilities' emissions, no single source category would contribute more than one additional cancer every thirteen years and no individuals would be exposed to an increased lifetime cancer risk of greater than one chance in one thousand. The Administrator considered these additional risks in light of the normal lifetime risk of fatal cancer of about 175 chances in 1000.

In the case of underground uranium mines, the Administrator withdrew the proposed standard because it did not meet the legal requirements of Section 112 of the Clean Air Act. However, he simultaneously initiated a new rulemaking for this source category.

The Sierra Club challenged the Agency's decision in the District Court and on December 11, 1984, the District Court found the Administrator and EPA in contempt and ordered the Agency to issue final standards or make a finding that radionuclides are clearly not a hazardous air pollutant. EPA complied with the order by promulgating final standards for all four source categories for which standards were originally proposed. However, litigation continues on this rulemaking.

The standards established by EPA for DOE facilities limit radionuclide emissions to an amount that causes a dose equivalent rate of 25 millirems per year (mrem/y) to the whole body or a dose equivalent rate of 75 mrem/y to the critical organ of any member of the public. Exposure at these levels for a 70 year period is associated with an increased individual lifetime cancer risk of about one chance in ten thousand. DOE may request that EPA establish an alternate standard at a higher level for specific facilities, if it can be demonstrated that no member of the public will receive a continuous exposure of more than 100 mrem/y effective dose equivalent and a noncontinuous exposure of more than 500 mrem/y effective dose equivalent from all sources, excluding natural background and medical procedures. We have not yet received such a request. Exposure for a 70 year period at 100 mrem/y effective dose equivalent is associated with an increased individual lifetime cancer risk of about one to two chances in one thousand.

The values for the final standards were selected for several reasons. First, they are consistent with the October decision that current practice protects the public health with an ample margin of safety. Second, the limits ensure that emissions do not increase over present levels. Third, the standards are generally consistent with the recommendations of the National Council on Radiation Protection and Measurements (NCRP) and the International Commission for Radiation Protection (ICRP).

EPA is now developing an implementation plan for its airborne radionuclide standards.

Hazardous Waste Standards

Under RCRA, EPA is to (1) define what is a hazardous waste and (2) issue regulations for hazardous waste generators and transporters, and for owners and operators of hazardous waste treatment, storage, and disposal facilities. Under the RCRA regulations issued by EPA, generators are responsible for determining if they have a hazardous waste.

The treatment, storage, and disposal facility regulations include requirements for: waste analysis, facility security, personnel training, inspections, floodplains and fault zones, contingency plans and emergency procedures, ground water protection, monitoring, and corrective action, financial responsibility, and closure and post-closure care. These regulations also contain specific design and operation requirements for containers, tanks, surface impoundments, waste piles, land treatment units, landfills, and incinerators.

There are several provisions in the 1984 RCRA amendments that extend EPA's authority, and which may be useful at the FMPC site. First, these amendments direct that all treatment, storage, and disposal facility permits issued after November 8, 1984, require corrective action for all releases of hazardous waste or constituents from any solid waste management unit regardless of the time at which waste was placed in such unit. This is referred to as the "continuing releases" provision. Second, whenever EPA determines that there is or has been a release of hazardous waste into the environment from a RCRA interim status hazardous waste facility, EPA may issue a corrective action order as needed to protect human health or the environment. Third, EPA shall require corrective action beyond the facility boundary where necessary to protect human health and the environment unless the owner or operator demonstrates that he is unable to obtain the necessary permission to undertake such action. EPA is to use corrective action orders until rules are developed to implement this provision. However, as mentioned before, current RCRA regulations apply only to wastes that are not source, byproduct, or special nuclear material.

The Agency's authority to handle radioactive waste at DOE facilities is somewhat expanded by the Comprehensive Emergency Response, Compensation and Liability Act (CERCLA) which defines hazardous substances as including "any hazardous air pollutants listed under Section 112 of the Clean Air Act." However, EPA is authorized to spend Superfund monies only on removal actions at Federal facilities and is not authorized to spend Superfund monies for remedial action at these facilities. Despite its authority to issue administrative orders to DOE, as well as to other Federal facilities, under the Federal Facilities Compliance Program, EPA has generally attempted to negotiate compliance agreements with Federal facilities in need of CERCLA response actions.

EPA-State Cooperation

EPA has delegated to the State of Ohio the authority for day-to-day operations and enforcement of environmental programs in the State. The State of Ohio has been delegated authority for implementation of the Clean Air Act, with the exception of airborne radionuclides; the Clean Water Act; and Interim Authorization Phase I for the Resource Conservation and Recovery Act. Under the Clean Air Act and the Clean Water Act, the role of the State is to assure compliance through permit issuance, site inspections, review of pollution control plans and, when necessary, enforcement actions. Our Agency has an oversight role to assure that a State is carrying out its responsibilities and to provide assistance to a State when asked.

Under RCRA, the State of Ohio has been delegated authority for inspecting interim status facilities to determine compliance with the RCRA-based regulations (or State rules where more stringent), and for enforcement where noncompliance is determined.

The State has inspected the FMPC for compliance with the RCRA regulations. It has also provided EPA with information on ground water monitoring conducted as part of their RCRA program. This monitoring constituted part of their investigation of the ground water contamination at the FMPC to determine whether chemical constituents, in addition to uranium, have contaminated the ground water. EPA Region V conducted a RCRA compliance inspection of the FMPC on March 16, 1984. Several violations associated with container storage of wastes and surface impoundments were identified. Region V sent the inspection report to the State of Ohio for appropriate action. The Ohio Attorney General has served DOE with a Notice of Intent to File Suit for RCRA violations. DOE has informed EPA Region V that it has met twice with the State of Ohio regarding the proposed lawsuit, and it may be possible to settle the issue with Ohio to correct all RCRA violations short of a trial.

EPA issued a NPDES permit to the FMPC on October 2, 1980. After the permit was issued, EPA delegated the NPDES permit program to the State. The existing permit contains a compliance schedule that requires the FMPC to install a biodenitrification facility treatment to control the release of nitrates, and to direct coal pile runoff to a sump for later treatment at the plant. These pollution control measures are scheduled to be operational by June 1986.

The State of Ohio is in the process of reissuing the NPDES permit and is negotiating a new compliance schedule with DOE for the FMPC.

With regard to air emissions, the FMPC's pollution permits are being reviewed by the local air quality agency for determination of the adequacy of the emission controls for all pollutants, except radionuclides. Implementation of the airborne radionuclides standard has not been delegated to the States. The State considers the FMPC a major source of air pollution and inspects the facility at least once a year to determine compliance with EPA's Clean Air Act standards. The last inspection took place on October 31, 1984.

EPA will continue to coordinate actions with the appropriate State agencies.

Feed Materials Production Center

In February of 1985, Region V conducted a preliminary review of the environmental impacts of past and present activitites at the FMPC facility. As a result of that review, Region V identified a number of concerns which were outlined in a letter sent to DOE in March from the Regional Administrator. I will submit a copy of this letter for the record. The letter included Region V's comments about existing operations at the FMPC facility and the Region's environmental concerns, and identified additional information necessary to do a complete assessment of the facility. EPA discussed its concerns and comments at a meeting with DOE on April 2, 1985. We anticipate a written response from DOE on the concerns in the letter and the issues discussed at the meeting.

Routine emissions to air from the FMPC consist primarily of slightly enriched uranium particulate matter discharged from vents on the roofs of buildings within the facility's boundaries. Most of these emissions come from the uranium tetraflouride production and repackaging in plant 4 and metal production and slag grinding operations in plant 5. The vents are equipped with bag filters that remove the largest particulates, however, uranium particulates of respirable size may escape into the atmosphere. These particulates can be transported long distances by prevailing winds.

The amount of uranium emitted to the air per year is measured by the plant operator by placing probes in the various stacks and sampling a small fraction of the effluent that is released. This is reported in units of curies per year of U-238, U-234, U-235, and U-236. Most of the emissions are U-238 and U-234 in approximately equal amounts with a small additional amount of U-235.

Based on emission information provided by the Department of Energy, EPA uses mathematical models to predict the airborne concentrations of the U-238 and U-234 as a function of location in the environment. Once the concentration value is known, additional models are used to estimate radiation doses and health risks using procedures recommended by the International Commission on Radiation Protection and the National Academy of Sciences.

This procedure is illustrated in the calculations made for the FMPC in support of the Agency's standard for radionuclide emissions to air from DOE facilities. It should be noted that more specific input parameters for individual facilities such as FMPC may alter dose estimates. It should be noted that more specific input parameters for individual facilities such as the FMPC may alter dose estimates. In 1981 emissions from the FMPC were approximately 0.11 curies of U-238 and 0.11 curies of U-234. To simplify this calculation, all releases were assumed to originate from a 10-meter stack at the center of the production area. One third of the uranium was assumed to be in a chemical form that is insoluble in lung fluids and therefore remains in the lung for long periods. The remaining uranium was assumed to be removed from the body within days or weeks. The actual solubility of the uranium compound emitted from the FMPC facility is not well known. If more of the uranium emitted is insoluble, the resulting dose would be higher. Conversely, if more is soluble, the dose would be lower.

The estimated annual radiation doses for 1981 to the major organs of nearby individuals assumed to be located about 1/2 mile northeast of the release point on the site boundary are as follows:

Pulmonary lung	88 mrem/y
Endosteal bone	26 mrem/y
Kidney	12 mrem/y
Red marrow of the bone	2 mrem/y

If one assumes that these individuals are exposed to these levels for seventy years, then the increased risk of developing a fatal cancer is about one chance in ten thousand.

To provide some perspective for these doses from the facility, average background in the State of Ohio is about 115 mrem/y; one chest x-ray gives a skin dose of about 20 millirem and a bone marrow dose of about 2 millirem.

Your staff provided us with historical emission data for the FMPC plant for the years 1953 to 1984. Using this data, we provided you an estimate of the resulting lung doses for each year. This was done by applying the ratio of 1981 doses to 1981 emissions to the emissions of a given year. This is an approximate procedure because many of the factors upon which the calculation is based may change with time, including meteorological conditions, stack configuration, particle size, and particulate solubility. Nevertheless, it is likely that the doses received by individuals living near the facility between 1954 and 1974 were considerably higher than at present and may have resulted in deposition of uranium in the environment around the facility.

Committee on Interagency Radiation Research and Policy Coordination

To facilitate the interaction of Federal agencies on radiation protection issues, the Office of Science and Technology Policy established the Committee on Interagency Radiation Research and Policy Coordination (CIRRPC) last spring. The purpose of this Committee, which is composed of 15 Federal agencies, is to coordinate radiation matters between agencies, evaluate radiation research, and advise the Office of Science and Technology Policy on issues of radiation policy. The Committee includes a Science Panel which is to (1) prepare an appropriate research agenda on selected radiation issues; (2) review completed research reports; and (3) advise the Committee on science issues important to formulating policy.

EPA has taken an active role in the development of CIRRPC. Our Assistant Administrator for Air and Radiation has served as Vice Chairman of the Committee. Staff from EPA serve on its Policy and Science panels. We have worked with the Committee to develop an agenda of priority issues in the radiation protection area and we expect our support and cooperation to continue.

Proposed Legislation

The last item I would like to mention is the legislation on mixed waste developed by Senator Glenn and Congressman Luken (S. 892 and HR 2009). We have not completed an Agency review of this proposed legislation. Because of complexity of the mixed waste issue we will need additional time to review the Bills.

Thank you. I would be pleased to respond to any questions that you may have.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

MAR 9 1985

5ME-12

Mr. Joseph LaGrone
Manager Oak Ridge Operations Office
U.S. Department of Energy
P.O. Box E
Oak Ridge, Tennessee 37831

Re: Feed Materials Production Center, Fernald, Ohio

Dear Mr. LaGrone:

The United States Environmental Protection Agency (U.S.EPA) Region V, has conducted a preliminary review of the environmental impacts of present and former activities at the United States Department of Energy Feed Materials Production Center (FMPC), Fernald, Ohio. The Agency's review was initiated as a result of the State of Ohio's Notice of Intent to Sue which was filed on December 18, 1984, pursuant to Section 7002 of the Resource Conservation & Recovery Act, 42 U.S.C. § 6927.

Pursuant to Executive Order 12088, and provisions contained in each of the major environmental statutes, federal facilities are required to comply with Federal environmental standards and regulations. Executive Order 12088 also provides that U.S.EPA shall act as technical advisor to assist other Federal agencies to achieve compliance.

U.S. EPA's review of the environmental impacts associated with the ongoing operation of the FMPC has identified the following major concerns: (1) the radiation monitoring program is inadequate; (2) there have been incidents of radioactive air emissions due to unsatisfactory operation and maintenence of control equipment; (3) the groundwater monitoring plan prepared by Dames and Moore for FMPC is inadequate; (4) there is a possibility that individual, non-community, and community drinking water supplies have been contaminated; and (5) the National Permit Discharge Elimination System (NPDES) permit monitoring requirements do not reflect the potential for discharge of radionuclides and other chemicals. Our attached comments address these concerns in detail.

Bill Franz of the Environmental Review Branch will call you within the next 10 days to arrange a meeting to discuss the Federal Facility Compliance Program procedures in light of our concerns, after staff at your agency have had the opportunity to review our comments. In the interim, if you have any questions regarding this letter or our attached comments, please contact Mr. Franz, at FTS 886-7500.

Sincerely yours,

/s/

Valdas V. Adamkus
Regional Administrator

cc: Don Marshall, OEPA Dayton
Robert Sleeman, DOE
Tom Winston, OEPA Dayton
Roger Hannahs, OEPA Columbus
Robert Quilian, Ohio Dept. of Public Health Columbus
Bobby Joe Davis, DOE Oak Ridge, Tennessee
Vincent Fayne, DOE Oak Ridge, Tennessee

bcc: Gary Gulezian 5AR ✓
Larry Jensen 5AR
Larry Kertcher 5AC
George Hurt 5AC
Bill Miner 5HE
Bill Muno 5HE
Ron Lillich 5HE
Ken Fenner 5WQ
Robert Hilton 5WG
Joe Harrison 5WD
Babatte Newberger 5RC
Mary Ellen Lynch 5R
Irene Little 5R

Environmental Protection Agency Region V's Comments on the Groundwater Study Workplan and the Environmental Reports for the Feed Materials Production Center (FMPC), Fernald, Ohio

The following comments are a compilation of the issues of environmental concern to the U.S. EPA from a problem-oriented perspective. We have identified the problems, the applicable regulations, and our proposed recommendations for solutions or further studies. These comments should lay the groundwork for negotiations between our respective agencies in regard to appropriate measures to be implemented in order to resolve our concerns.

1. INADEQUACY OF RADIATION MONITORING PROGRAM

A. INCONSISTENT STANDARDS

The standards applied in the National Lead of Ohio (NLO) Environmental Monitoring Annual Reports (ER) and the Dames and Moore Draft Task Force Report are generally equal to or, in three cases, more conservative than comparable Nuclear Regulatory Commission (NRC) standards (10 CFR 20). There are, however, a number of standards applied which are significantly less restrictive and some instances where there are no apparent standards which can be applied.

Air

The Dames & Moore report refers to a DOE standard of 3 mg/m^3 for uranium in air (Table 9, pg 2-36). This converts to 2×10^{-9} uCi/ml and compares to 5×10^{-12} uCi/ml for uranium-natural in the 10 CFR 20 standards. There appears to be a factor of 400 difference between these two standards. Is this an error, or is the DOE standard really 400 times less stringent than the NRC standard?

Water

The 1983 ER uses a radium in water standard of 30 picocuries per liter (pCi/l) when applied to well water samples (Table 5, pg 19). At least one of these wells is at a private residence. EPA's drinking water standard for combined radium-226 and radium-228 is 5 pCi/l. Consequently, the standard being used (it appears the DOE standard is 30 pCi/l for each of the two radiums) is at least 12 times less stringent than actual or anticipated EPA community drinking water standards. Although EPA's standards apply directly to community water systems, not individual wells, the variance in standards is still worth noting. The basis for using 30 pCi/l rather than the EPA standard should be explained.

The 1983 ER uses a standard of 1.2×10^{-6} uCi/ml (1200 pCi/l) for uranium in well water (Table 5, pg. 19). While this compares with 3×10^{-5} uCi/ml in the 10 CFR 20 standards, it can also be compared to an anticipated EPA uranium in drinking water standard of 100 pCi/l or less, perhaps even 40 pCi/l. Again, there is considerable difference in these standards, and the justification for that difference should be spelled out.

Milk

Uranium in milk concentrations are tabulated in the 1983 ER (Table 13, pg 33); uranium in soil and sediment concentrations are also tabulated in the 1983 ER (Tables 8, 9, 10, pg 23 & 26) however, no standards for judgment are given. The basis for judging whether there is a risk associated with these concentrations must be delineated.

Specific Activity

Finally, the report fails to make the change in specific activity for uranium which had been made in NLO's 1983 ER, thereby introducing a factor of two error in activity and dose estimates. The 1983 ER notes (pg 14) that, in the past, a specific activity of 3.33 x 10^{-7} uCi/gm was used to convert the analytical results to activity, but was being changed to 6.77 x 10^{-7} uCi/gm to correspond to NRC practice. Dames and Moore failed to make this correction in their reports, which could lead to an underestimate by a factor of two in activities and, therefore, in dose. This discrepancy should be resolved.

B. INADEQUATE SAMPLING

Substantial problems are evident in the environmental monitoring program because analytical programs focus too narrowly on uranium to the exclusion of other critical radionuclides. Radium analyses should be expanded, especially with well water. In addition, very little attention has been paid to transuranics, although they are released into the air and surface water.

The sampling programs are not consistent in time or site. If collections were made at all similar sites at the same time and analyses performed uniformly on all samples, it would greatly aid in comparison and assessment of data.

Air

For the ambient air concentrations gross beta, uranium, neptunium, plutonium, and thorium concentrations are compiled in the 1983 ER (Tables 1 and 2). It is not clear whether these are the only radionuclides present or the only ones compiled. A clarification is needed. No mention is made of whether gamma-ray screening was performed routinely or whether offsite air monitors were used. This is a clear deficiency. The reasons for this limited approach should be detailed.

Water

Radioactive contaminant levels in water are compiled in the 1983 ER (Tables 5 and 6). Uranium, radium-226, radium-228, gross alpha and gross beta concentrations are listed in Table 5. The table has a number of peculiarities as the analyses performed are not consistent across the sites. Uranium, gross alpha and gross beta analyses are performed at sites W1, W3, W4, W5, W7 and W8. Radium analyses are performed at sites W1, W3, W4, W5, W7 but not W8. No results are reported at all for W6. Analyses at W2 are extremely detailed, unlike the other sites, and include values for cesium, neptunium, plutonium, radium, ruthenium, strontium, technetium, thorium, and uranium. The reason for the decision to further limit sampling at the remaining sites should be provided.

Again, in Table 5, radium samples are collected without consistency. W1 and W3 data are prepared, from 1-month composites of daily samples; W4 data are prepared from 1-month composites of weekly samples; W7 data are prepared from composites of all available weekly samples: W5 data are prepared from 2-month composites of weekly samples; and W2 data are prepared from 1-month composites of daily samples. No mention is made of W8. This nonuniform sampling protocol makes inter-comparisons of data bv time and place very difficult, if not impossible. A uniform collection system should be devised.

Table 6 lists many specific radionuclides that are analyzed on a nonuniform schedule. Twenty-four hour samples are analyzed for uranium, gross alpha and gross beta. One month composites of daily samples are analyzed for radium-226, radium-228, ruthenium-106, and thorium. Long-term composites are analyzed for other radionuclides. Again, there is no consistency in radionuclide analyses performed. A uniform sampling schedule for the parameters of interest should be developed.

Table 12 lists 21 offsite wells sampled from 4 to 12 times per year. No description is given of the tvpes of wells, although the Dames & Moore reports do distinguish between domestic and commercial wells. Some are known to be residential. Nine of the wells are sampled less than six times per year, while the remainder are sampled 11-12 times per year. Only uranium results are compiled; however, radium could be an associated contaminant if uranium is present. Minimally, the radium concentrations should have been found in order to assess whether DOE water standards have been met. Consideration should be given to analyzing for pollutants other than uranium; transuranics might also be suspected contaminants. Gamma screening would also be very useful on these well samples.

Aquatic biota sampling should be included in sampling of both Paddy's Run Creek and the Miami River. In addition, there was no mention made of cistern sampling which should also be included in the monitoring program.

Soil

Soil samples were taken in 15 locations both onsite and offsite. Sediment samples were taken from seven onsite locations and seven Miami River locations. One was taken far offsite. Uranium and technetium analyses were performed on sediments and uranium analyses on soils.

Again, why not the same analyses on all samples? If other analyses were done, such as transuranics, no results were reported.

Milk and Other Farm Products

Table 13 lists results for uranium in milk analyses from two farms, one neighboring and one 18 miles distant. This is an extremely small sample population, in view of the fact that the plant is located in farm country. Many critical pathways were not covered in the sampling programs. Farm country pathways through forage and feed to food sources and food products, except for milk, are not discussed. Results for uranium analyses on vegetables are referenced on the bottom of page 36 of the 1983 ER, which is the only reference to analyses taken on food pathways other than milk. No vegetable analytical results are tabulated, nor are collection procedures discussed.

Gamma-ray Doses

Table 15 shows that the seven monitors placed at the fence line give dose rates about what would be expected, based upon the national average radiation background. The lack of background and offsite monitors used for air sampling and gamma-dose rate measurements should be addressed.

Flyash Piles

Flyash piles generally contain considerable uranium, radium, and thorium. These should be included in the monitoring program, particularly in terms of runoff, seepage, blowoff, and radon emissions.

C. CONCLUSIONS FROM DATA REVIEW

It is our conclusion that contamination is definitely present in offsite wells and soils near the east fence line. Several unanswered questions are presented by the elevated gross alpha, gross beta, technitium 99, and uranium levels at some sites. The origin of the radium 228 in water discharges for 1983 also remains unexplained, since thorium was not processed at FMPC that year. There is a considerable difference between dose projections presented in the 1983 ER and the EPA offsite dose projections developed for the Clean Air Act background material.

Water

Table 5 shows uranium, radium-226, and radium-228 concentrations in water to be less than 10% of the DOE standards. Gross alpha concentrations were 17% and 26% of the standard at sites W7 and W8, respectively. Gross beta concentrations varied between 20% and 70% of the DOE standards, with W7 and W8 being 53% and 70% respectively. The source of these alpha and beta emitters should be provided, particularly if the uranium and radium concentrations are low.

In Table 6, the radium-228 concentration at W2 is 32% of the standard. This is surprising because the ER states thorium was not processed on the plant that year (1983). What is the source of the radium-228? Technetium-99 and uranium levels are also elevated, with uranium running 51% of the DOE standard. Shouldn't control measures be instituted to bring these discharges down? What is (are) the reason(s) for the higher discharges?

ug/l

Table 11 shows uranium concentrations in onsite monitor wells range between 1 and 26.5mg/l, while Table 12 shows offsite wells range between 0.2 and 431 mg/l. The latter converts to 0.14 - 292pCi/l and can be compared with EPA uranium in Ohio well and surface water data (<2pCi/l) and with an anticipated EPA uranium in drinking water standard in the range of 40-100 pCi/l. Of the three wells that exceed 40 pCi/l, two are commercial and one is domestic. The domestic well has a concentration of 140 pCi/l. The reason for the delay in beginning the sampling of offsite wells should be addressed. It is apparent the onsite monitor wells are not an indicator of offsite contamination.

Soils and Sediments

Table 8 lists uranium concentrations in soils onsite and offsite. No standards are given in the ER by which to judge these levels, which range from 2 - 53 pCi/gm. The basis for judging the soils should be provided. Radium and transuranic concentrations, if elevated, would have been very useful but were not given. Soil uranium concentrations ranged from 2-53 pCi/gm and can be compared to normal soil levels at about 1 pCi/gm. Those sites at the east fence line (sites 3 and 11) show definite contamination.

2. AIR EMISSIONS AND LACK OF ADEQUATE OPERATIONS AND MAINTENANCE PROGRAM

The steps required in uranium metal processing are quite difficult and require extensive surveillance, in order to keep radioactive releases to a minimum. The various types of air pollution control equipment used, the nature of the process, and the harm that any release of radioactive material into the atmosphere can cause require that the source adhere to very strict operating and maintenance practices. The release of radioactive material reported on December 11, 1984, indicates that the existing operating and maintenance practices at FMPC should be reviewed, and changes made to improve the procedures.

The FMPC has been an ongoing operation since 1954 and: since it is projected to be in operation beyond 1990, all air pollution control devices should be tested for performance again, even though they were initially tested when installed. Most devices, in constant use, will deteriorate and lose efficiency. A testing program, as suggested, would identify any devices needing upgrading or replacement. FMPC should also acquire and install automatic monitoring instruments to be used at the baghouses. These instruments would warn the operators of any breakdown of the filtering system much sooner than the instruments now installed in the stack.

Again, we would strongly suggest that an effective operating and maintenance program be developed and implemented for all air pollution control devices and instruments.

Congressmen Dingell and Luken requested USEPA to review the steps the DOE plans to take to prevent a recurrence of releases of radioactive material at FMPC. The corrective actions proposed by DOE appear to be interim in nature. We recommend that the following measures be included in the plan of action:

A. Include an on-site Senior Environmental Engineer and necessary technicians in the proposed cadre of specialists.

B. Develop an operating and maintenance program dedicated to the upkeep and operation of all pollution control equipment (air, water, etc.).

C. Assign experienced and skilled craftsperson to the maintenance and operation of all pollution control devices. These craftspersons should be responsible for pollution control only, and not be diverted to production activities.

D. Develop a record-keeping program to log incidents of malfunctions that could create radioactive releases.

E. Research the possibility of installing two baghouses in series at the plants where radioactive releases could occur.

F. Authorize the senior member of the on-site cadre of specialists to shut down any equipment if it is determined that a radioactive release could occur.

G. Maintain an inventory of essential spare parts for all the pollution control devices and monitoring instruments.

H. Train all personnel involved with pollution control activities in the safety, operation and maintenance of the control devices and instruments.

I. Provide responsible pollution control supervision and management to assure that the personnel and equipment are performing in a satisfactory manner.

In case of an accident, the facility could emit anhydrous hydrogen fluoride and ammonia in sufficiently large quantities to cause injury to persons beyond the property line. EPA does not require that there be contingency plans for such an eventuality, but we do believe it would be prudent to have such plans in place to minimize the likelihood of injury. An Emergency Response Plan should cover the likelihood of releases of any hazardous materials, and include actions to be instituted outside of the plant proper, should this be necessary.

Our telephone communications with the Southwestern Ohio Air Pollution Control Agency revealed that there is currently a consent decree covering the FMPC's boilers. The Agency and FMPC are working together to procure a submittal of operating permit applications for all facilities at FMPC. Once these applications are submitted, they should be reviewed in regard to control devices and areas requiring control at the site.

3. INADEQUACY OF FMPC GROUNDWATER MONITORING PLAN

A. NATURE OF CONTAMINATION

Uranium has been identified as the primary constituent of interest in the groundwater monitoring plan proposed by Dames and Moore. Sites at the facility which have the potential for affecting ground water, e.g., infiltration from Paddy's Run Creek and related storm water drainage, fly ash piles, waste piles and waste pits and drainage from the plant production area, as well as air-released contaminants should be identified and characterized by actual waste analyses, EP toxicity tests and review of historical records. Only when the list of potential contaminants is available can an effective monitoring program be developed. For example, if uranium is primarily in the form of uranium oxide, the monitoring program will look quite different from a plan for a more soluble constituent like uranium nitrate.

Additionally, parameters selected for analysis should reflect the types of materials used in the manufacturing process and of wastes generated presently and in the past at FMPC, including specific organics and heavy metals. FMPC should conduct a thorough review of present and past waste handling and conduct an inventory of all chemicals and radioactive material used.

General information on materials and chemicals disposed in the waste pits should be provided, including but not limited to information on the wastes placed in the pits, the period of time wastes were received at each pit, when they were closed, how closure was completed and whether or not a liner was used in the construction of the waste pits. Information should also be provided on whether the wastes have been representatively sampled, the results of any sampling, whether the pits ever received hazardous waste(s), whether the liquid waste from the general sump has been tested for organics or heavy metals prior to discharge to the liquid waste pit, and the method and location of disposal of the sludge from the sump.

B. HYDROGEOLOGIC REGIME

The Dames and Moore report describes surficial local geology as glaciofluvial deposits that are highly variable in composition, thickness and areal extent. Shallow material is clayey till overlying a thick sand and gravel aquifer containing clay lenses. Movement of uranium-enriched clay particles can take place through fractures and joints in the clay till and through coarse sands and gravels.

The factors that will influence whether the contaminant accumulates or is transported include permeability and grain-size distribution relative to clay content and filtering capability. This information should be provided by a careful drilling, soil sampling and analysis program.

C. DRILLING, WELL CONSTRUCTION AND SAMPLING CONSIDERATIONS

The goal of any groundwater monitoring program is to obtain a sample of representative formation water from the zone being monitored. Any proposed drilling technique must be evaluated relative to its potential affect on the targeted constituent. Dames and Moore has proposed the use of conventional mud rotary drilling techiques for FMPC. Field experience has shown that it may be practically impossible, using conventional well-development techniques, to completely remove all traces of drilling mud from the formation. Zones of "lost circulation" encountered during drilling can accept large volumes of mud that are essentially irretrievable. The overpumping technique described by Dames and Moore to develop the wells cannot assure that no effect from drilling mud will remain within the aquifer, even after "clear water" pumping has been achieved. Absorption of uranium onto residual drilling mud would result in artificially low concentrations of the contaminant in sampled water. Therefore, an alternative drilling technique (e.g., cable tool) is recommended.

Careful soil sampling during drilling will provide the best information concerning zones of uranium accumulation. Continuous split-spoon sampling should be done instead of the 5-foot intervals proposed by the consultant, since the zone(s) of contaminant accumulation could be thin, discontinuous and variable in-depth depending on local conditions. These samples should be analyzed for any and all contaminants that may have been used or disposed within the FMPC site.

Permeability testing is proposed as a way to predict flow velocities and aquifer yields. However, only disturbed (split-spoon) samples will be available on which to run tests. Considering the importance of identifying flow pathways available through joints and fractures in the clay and/or relatively thin lenses of sand in an area, relatively undisturbed Shelby tube samples are recommended for laboratory permeability tests. Dames and Moore should propose drilling a number of test holes to obtain Shelby tube samples of representative subsurface materials.

Well construction details appear adequate as proposed, except that the well annulus should be cement grouted from the bentonite seal to the surface using a tremie pipe instead of backfilling as indicated.

To prevent possible contamination by the sampling equipment, stainless or teflon well casings should be used rather than PVC when obtaining sediment and groundwater samples.

Sample collection is equally important in assuring accurate results. Field preservation (with HNO_3) of turbid samples could release some previously insoluble uranium oxides adhering to clay particles and result in higher analysis results. Care should be taken to assure that clear water samples are taken, or that they are field filtered prior to preservation.

D. WELL DISTRIBUTION

For uranium oxide, a major goal of monitoring should be to establish the pattern of accumulation in the subsurface soil and water and to delineate the affected area. Shallow, intermediate, and deep sampling monitoring zones should be able to define the zone of leaching, the zone of accumulation and the unaltered zone. These three horizons should be identified by a sufficient number of carefully spaced wells. These wells would produce a profile which would show zone thickness, depth and areal extent. Although well distribution should reflect groundwater flow patterns, the site as a whole should be monitored to assess the effect of air-transported contaminants. The 5 cluster wells and 3 lysimeter installations proposed by Dames and Moore appear adequate to develop a preliminary profile, but a more detailed analysis will probably be needed.

The Dames and Moore Ground Water Monitoring Plan does not provide for continuous groundwater monitoring. An adequate monitoring program that complies with 40 CFR 265 Subpart F should be implemented. It appears that wells 18s and 18d are too far downgradient from the waste pits, and wells 19s and 19d may also be located too far from the waste pits. Off-site wells should be sampled, upgradient wells designated, and the aquifer being used for upgradient sampling identified.

The proposed groundwater monitoring system can be considered only a first-step effort toward an adequate groundwater monitoring system under the interim status standards of RCRA. Until the actual groundwater flow patterns are established at the site and it is determined what effects the production wells have on these flow patterns, the acceptability of the system cannot be adequately evaluated. Additionally, the DOE should determine how many RCRA regulated units there are at the facility. For example, if only one waste pit is considered RCRA regulated, there may not be as many wells needed as if all five pits are considered regulated.

4. CONTAMINATION OF DRINKING WATER SUPPLIES

It is suggested that DOE re-sample previously sampled private wells and any other drinking water wells in the immediate vicinity. Any drinking water wells showing above-background levels of contamination should be placed on a schedule of continued monitoring to determine if levels are increasing. If any drinking water systems are found to have contamination exceeding current maximum contaminant levels (MCL's) or health advisories, action will have to be taken to provide treatment or an alternate water source. The Ohio Environmental Protection Agency (OEPA), Division of Public Water Supply, should be kept informed of the results of all sampling of drinking water sources. Also, the sources for any increases noted in drinking water contamination levels would need to be identified and mitigated. There should be no detectable impact on drinking water quality because of the operation of FMPC.

5. NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT MONITORING REQUIREMENTS

A. PRESENT NPDES PERMIT

The existing National Pollutant Discharge Elimination System (NPDES) permit for the Fernald, Ohio, facility was issued on October 2, 1980, and expired February 1, 1985. Under Ohio State Law, a permit cannot be reissued unless the permittee is in compliance with the previously issued permit. Regardless of the action taken by the State, the DOE should achieve compliance with the final effluent limitations in the existing permit as expeditiously as practicable.

A compliance schedule was included in the permit that required the FMPC to install a biodenitrification facility and to divert coal pile runoff such that it enters the General Sump system. Construction was to be completed by April 1, 1984, an operational level was to be attained by June 30, 1984, and final effluent limits became effective July 1, 1984. However, the facility was never constructed and; therefore, FMPC is not in compliance with the final effluent limits.

OEPA referred FMPC to the State Attorney General for enforcement litigaion based on non-compliance with the above-mentioned schedule, and for violation of certain final effluent limitations that were to be achieved as a result of modifications required in the compliance schedule.

B. Permit Renewal

A review of the NPDES permit renewal application submitted to the Ohio EPA Southwest District on September 20, 1984, indicated that Form 2C data for in-plant Outfalls 001A, 001B, 001C, and 001D would be submitted at a later date. In addition to requirements for reporting quantitative data for the Organic Priority Pollutants at these in-plant outfalls, it is strongly recommended that any other substances indicated to be present in the extracts by peaks on the reconstructed gas chromatograms (total ion plots) more than 10 times higher than the adjacent peak-to-peak background noise should also be reported. Identification of these substances should be by reference to the EPA/NIH computerized library of mass spectra, with visual confirmation by an experienced analyst. Quantification may be an order-of-magnitude estimate based upon comparison with an internal standard. Furthermore, the average concentrations, and concentration ranges for uranium should be reported for the in-plant outfalls, as was done for Outfalls 001 and 002 in the first portion of the permit renewal application.

In the September 26, 1984, Draft Task A Report-NLO Ground Water Study, strong evidence was provided which indicates that waters discharged to the storm sewer ditch (Outfall 002) may be a primary source of the above background concentrations of uranium in offsite groundwater. Furthermore, untreated storm water runoff discharged from Outfall 002 may be toxic to endemic aquatic life in the low-flow receiving stream (Paddy's Run Creek). Consequently, it is recommended that the permittee conduct a cost/benefit study to determine whether it is technically, feasibly, and economically reasonable to upgrade the capacity of the storm sewer lift station such that all of the storm water can be diverted to the General Sump area for additional treatment and subsequent discharge to the Great Miami River.

DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service

Centers for Disease Control
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TESTIMONY OF

PHILIP J. BIERBAUM
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CENTERS FOR DISEASE CONTROL
PUBLIC HEALTH SERVICE
DEPARTMENT OF HEALTH AND HUMAN SERVICES

BEFORE THE

COMMITTEE ON GOVERNMENTAL AFFAIRS
U.S. SENATE

APRIL 22, 1985

Mr. Chairman and Members of the Committee, I am Philip J. Bierbaum, Deputy Director, Division of Surveillance, Hazard Evaluations, and Field Studies, National Institute for Occupational Safety and Health (NIOSH) of the Centers for Disease Control. With me today is Dr. James Melius, Chief, Hazard Evaluations and Technical Assistance Branch. We are pleased to appear before this Committee to discuss NIOSH activities relating to the health and safety of workers employed at nuclear facilities.

In comparison with the number of epidemiologic studies NIOSH has conducted over the years in other areas of American industry, our experience with nuclear facilities has been minimal. We have conducted only three major studies involving Federal operations: (1) an evaluation currently in progress of the Feed Materials Production Center (FMPC) in Fernald, Ohio, operated by National Lead Company of Ohio, Inc. (NLO); (2) a study of radiation exposures at the Goodyear Atomic Corporation (GAT) in Piketon, Ohio; and (3) a study of deaths from cancer at the Portsmouth Naval Shipyard (PNS) in Kittery, Maine.

NIOSH is mandated to conduct epidemiologic field research in general industry through the Occupational Safety and Health Act and in mining through the Federal Mine Safety and Health Act. These Acts provide us with right-of-entry into general industry and into mines. However, they do not provide right-of-entry into Federal facilities or into facilities operated by Federal contractors unless we have the cooperation of the

Agency in charge. Our responsibilities for Federal facilities are outlined in Executive Order 12196. Requests for our assistance to evaluate potential problems at these facilities can come from the agency, the employees or their representatives, or agency management and employees jointly. For the three studies we are discussing today, the requests for our involvement came from the unions representing workers at the facilities.

UPDATE OF NIOSH ACTIVITIES AT FMPC

1. Overall Evaluation.

In February, 1983, NIOSH received a request to conduct a general health hazard evaluation of workers at the Feed Materials Production Center (FMPC), in Fernald, Ohio, operated by NLO, Inc. The International Association of Machinists and Aerospace Workers, one of 14 separate unions comprising the Atomic Trades and Labor Council (ATLC) at NLO, submitted this request. The plant, in operation since the early 1950's, processes uranium-bearing ores and residues into fuel elements for the U.S. Department of Energy (DOE).

From February through March 1983, NIOSH investigators contacted representatives of the Union, NLO, and DOE to obtain background information about the plant operations, to obtain more information on the nature of employee concerns, and to arrange with DOE for a visit to the facility.

On October 12, 1983, NIOSH investigators visited NLO and conducted a walk-through inspection of the facilities. Discussions at that time led NIOSH to request copies of all available NLO health and safety reports and to request access to NLO medical and environmental records to help us determine how to proceed. In January 1984, DOE forwarded to us copies of 16 published and internal reports (covering 1956-1975). DOE did not release access to personnel exposure and medical records because these records are maintained under the authority of the Privacy Act of 1974. DOE's "routine use" regulations under that Act had to be amended before access to these records could be granted to NIOSH.

DOE proposed giving NIOSH access to these records in an amendment to their regulations published in the Federal Register notice on November 2, 1984. The notice of the final DOE decision to grant NIOSH access to these records was published in the Federal Register on February 21, 1985, and became effective March 25, 1985.

On March 14, 1985, NIOSH medical investigators met with DOE, union, and NLO representatives at the FMPC. The union presented a comprehensive list of health and safety issues that they wanted NIOSH to evaluate. The NIOSH investigators then reviewed at the plant the medical and exposure record systems and requested copies of certain documents and data; most importantly, we requested the individually identified urine uranium monitoring results from all workers for several selected years. We have not received this information.

When we receive this information, we plan to analyze the urine uranium data to determine the extent of exposure to uranium and to determine whether workers in certain areas of the Plant have substantially higher or lower exposures than the workforce as a whole. We plan to evaluate the effects of uranium exposure on the kidneys and lungs, but when we have the results of the uranium analysis, we will be able to decide what type of study to do or which workers to include.

In the spring of 1984, as part of this evaluation, NIOSH became aware of a recently published doctoral thesis (by Jerome Wilson) which reported an increased incidence in non-malignant respiratory disease at NLO. This study had, however, a number of limitations. DOE plans to conduct further epidemiological studies to address some of these limitations. The NIOSH investigators recently met with epidemiologists from Oak Ridge Associated Universities, who will perform these studies, to discuss their studies at NLO and any data they may have available which might be useful in the NIOSH study.

2. Plant 9 Uranium Releases

In December 1984, NIOSH received an additional request from the NLO unions to assess the potential health effects to workers of uranium releases recently reported for NLO Plant 9 operations. The major issue here is to determine whether or not workers have internal body burdens of uranium in excess of the maximum permissible amounts as a result of exposure.

To address this issue, NIOSH investigators met with representatives of DOE, NLO, and the ATLC on December 17 and, based on a review of the information available, NIOSH recommended that all potentially exposed Plant 9 workers undergo bioassay testing to determine lung burdens of uranium using the DOE in vivo mobile counter. This was recommended because the counter was readily available and would be able to address the question concerning internal radiation burden. On January 11, 1985, NIOSH recommended lung burden counting on 4 workers by a second laboratory, Argonne National Laboratory, for comparison with the DOE mobile counter results. Results from the independent laboratory differ from the results from the DOE mobile counter. NIOSH cannot resolve the apparent discrepancies with the present data. Therefore, to further evaluate whether or not workers have absorbed excessive amounts of radiation, we recommended to the company and the union on March 25, 1985, that additional testing be conducted by the Battelle Pacific Northwest Laboratory. The in vivo system at that laboratory offers significantly better capabilities, a lower detection limit for uranium 235, and higher resolution than the previous two counters used. On March 27, 1985, NIOSH met with NLO, DOE, and the workers to discuss these findings and make the above-mentioned recommendations. The workers and the union are now determining whether they will participate in this additional testing.

UPDATE OF NIOSH ACTIVITIES AT GAT

In 1979, the Oil Chemical and Atomic Workers (OCAW), which represent the workforce at the Goodyear Atomic Corporation (GAT), located in Piketon, Ohio, requested that NIOSH evaluate occupational exposures and their effect on the health of workers at this plant. The OCAW was concerned primarily about exposures to radiation from uranium hexafluoride, which is enriched to 98% uranium 235 at the plant. They were concerned that these exposures may have produced excess cancer among the workers.

There was a quite lengthy delay in NIOSH initiating the study because DOE initially believed it would handle the evaluation themselves and because NIOSH staff had to obtain the proper security clearances. Once these issues were resolved, a two-part study was undertaken by NIOSH: 1) An industrial hygiene study was conducted to evaluate occupational exposure levels to radiation and other agents, and 2) an epidemiologic study was conducted to determine whether the workers at the plant have experienced any excess mortality, particularly from cancer, that could be associated with exposures at GAT.

Industrial Hygiene Survey. Because of the size of the plant, the industrial hygiene study was conducted in three phases.

1. A qualitative assessment was conducted of chemical and physical agents to which workers at GAT may potentially be exposed. This assessment was conducted in March 1982 to obtain information that would: 1) aid in future plans regarding quantitative evaluation of

chemical agents and ionizing radiation, and 2) form part of the industrial hygiene data base for the epidemiologic evaluation. The survey assessed exposures to chemical and physical agents for 24 job titles in approximately 50 departments. No environmental sampling was conducted as part of this assessment.

2. A quantitative assessment was conducted of surface radiation activity at selected sampling sites in six production related buildings. This survey, conducted June 27-July 1, 1983, was particularly important for its assessment of (removable) alpha activity (the activity detected on a 44mm filter wiped over 100cm^2 of the selected sample surface). Alpha radiation is the predominant radiation form emanating from the decay of uranium 238 and 235 nuclides. The surface alpha radiation is a particulate radiation form and can become airborne. This can pose a potential inhalation radiation hazard, or it can "rub" off on workers coming into contact with the contaminated surface, thus posing a potential ingestion hazard.

Levels of alpha surface activity measured in each of the selected buildings will be used to develop comparative indices of surface activity. It is hoped that these indices will provide a comparative indicator for the workers of quantitative potential exposure to internal radiation.

For the survey, approximately 1035 sample points were measured. Beside measurement of removable alpha surface activity level at each sample point, total alpha surface activity and beta and gamma radiation levels also were measured.

3. A statistical analysis is being conducted of environmental/bioassay data collected by GAT. GAT provided NIOSH with the following data: continuous air-monitoring, film badges, urinalysis, and whole-body radiation--also known as *in-vivo* data. Data analyses are focusing on the continuous air-monitoring, the urinalysis, and the whole-body radiation, since all of these provide indication of internal radiation exposure. These data bases are large: the air-monitoring data base has approximately 377,000 records, the urinalysis base has approximately 135,000 records, and the in-vivo base has approximately 6,700 records.

The purpose of analyzing the above data is threefold:

a. To determine environmental radiation variability in production related buildings as an aid in planning statistically defensible, quantitative assessments of exposure. In particular, we determined data variability from the continuous air-monitoring data associated with airborne alpha activity levels in selected production buildings, for specified time periods. We then used the variability in the data to determine the required number of sample sites in the selected buildings for the alpha surface activity survey. The sample sizes allowed us to detect a 100% increase/decrease in average radiation levels from building to building with a 90% chance of finding statistical significance.

b. To obtain some indication of the radiation exposure and the absorbed dose that has occurred since plant began operation in 1952. The urinalysis and the in-vivo data tapes can shed light on these variables. These data (in-vivo, urinalysis) are being used to develop crude exposure/dose estimates for use in the epidemiologic evaluation.

c. To obtain an indication of historical exposure trends at GAT. Such trend data may reflect the efficacy of radiation protection and control efforts.

We are continuing with analyses of the industrial hygiene and radiation data. A final report summarizing the analyses along with more detailed observations/recommendations will be completed late in 1985.

Epidemiologic Study. The epidemiologic study at GAT is a retrospective cohort-mortality analysis. In this type of analysis, the number of deaths from a specific cause among the workers employed at the plant is compared with the number of deaths expected from this cause, assuming the workers would have died from this cause at the same rate as that for the U.S. population as a whole. In this study, we will attempt to address specific hypotheses based on the exposures at the plant. For example, is exposure to radiation from enriched uranium associated with excess mortality from lymphatic/hematopoietic cancer? The historical GAT urinalysis data and the data generated by the NIOSH industrial hygiene study will be used to examine whether the mortality results are associated with specific exposures or jobs at the plant.

Approximately 8000 workers have been employed at the plant since it opened. For the retrospective cohort mortality study, we have successfully traced the vital status of approximately 97% of these workers. There have been 607 deaths. We are currently analyzing the mortality data for the cohort. We anticipate that this analysis will be completed during the summer of 1985.

UPDATE OF NIOSH ACTIVITIES AT PNS

In May 1978, a Boston hematologist reported a five-fold increase in proportional mortality from leukemia and a two-fold increase from all cancer among workers employed in the maintenance of nuclear submarines at the Portsmouth Naval Shipyard (PNS) in Kittery, Maine. PNS built ten nuclear submarines between 1956 and 1971 and overhauled 60 nuclear powered submarines between 1959-1978.

After being alerted to the reports of the Boston hematologist by PNS union representatives, the predecessor of the Subcommittee on Health and the Environment of the Committee on Energy and Commerce, U.S. House of Representatives, requested that DHHS investigate this potential problem. NIOSH conducted this investigation by performing (1) an evaluation of the Radiological Control Program at the Shipyard; (2) a retrospective-cohort mortality study of all shipyard employees (radiation and non-radiation workers); and (3) case/control studies of deaths from leukemia and lung cancer.

Occupational exposure to ionizing radiation at PNS was limited to x-ray and to radionuclide sources used in industrial radiography. In July 1950, a photodosimetry program was begun, using film badges instead of pocket dosimeters as the primary device to measure occupational radiation exposure. In 1958, the Radiological Control Program was established in support of Naval nuclear propulsion work at PNS.

The first extensive radiological control work for occupational radiation exposure was that associated with the overhaul and refueling of the USS Nautilus, beginning June 3, 1959. This date is generally considered the start of nuclear work at PNS.

The basic functions of the Radiological Control Program at PNS can be divided into four general categories as follows:

1. Direct worksite surveillance
2. Technical planning and direction
3. Training of radiation workers and radiological control personnel
4. Radiological health and environmental health physics.

The Navy policy for ionizing radiation is, and has always been, to limit the radiation dose to the worker to a level as low as reasonably achievable (ALARA). In setting dose limits, the Navy has relied on the recommendations of national and international standards organizations for guidance.

The NIOSH evaluation addressed the following questions about the Radiologic Control Program:

1. Were the dose data the shipyard provided to NIOSH for the epidemiologic study adequate measure of the employee's dose?

2. Was the radiologic control program effective in protecting the worker from radiation hazards?

3. Did accidents or incidents occur which resulted in exposure of the worker to external or internal radiation sources?

4. Were there any unreported accidents or undocumented exposures?

5. Has the nuclear work at PNS had an effect on the surrounding environment?

Regarding these questions, the NIOSH evaluation showed that the radiation control program was effective in protecting the worker, the environment, and the general public.

Retrospective Cohort Mortality Study. The objectives of this study were: (1) to determine whether any excess cause-specific mortality exists at PNS, particularly for those causes previously reported by the Boston hematologist; (2) to determine whether a particular type of work (radiation, non-radiation) was associated with excess cause-specific mortality; and (3) to determine whether a dose-response relationship exists between radiation dose and specific mortality from any cause.

The study cohort consisted of 24,545 individuals who had worked at the Shipyard at least one day between January 1, 1952, and August 15, 1977. Of these, 7,615 had a cumulative, lifetime, radiation-exposure history of at least one millirem. Another 1,345 had been monitored for radiation exposures, but had a cumulative recorded dose of zero. The remaining 15,585 had no record of ever having been exposed to radiation.

Total mortality for radiation workers was well below that expected (833 deaths versus 1,065 expected), including cancer deaths, 201 versus 218 expected. Of the cancer deaths, seven were due to leukemia and aleukemia while 8.3 such deaths were expected. Total mortality for the non-radiation workers was approximately the number expected (3,733 deaths versus 3,801 expected), including 726 cancer deaths versus 723 expected. Of these cancer deaths, 33 were due to leukemia while 29 were expected. The results of the Boston hematologist were therefore not confirmed. Based on these analyses, we concluded that excess deaths due to malignant neoplasms and due specifically to neoplasms of the blood and blood-forming tissue were not evident in civilian workers at PNS. We informed the Navy and the union of these results and published our data in Lancet in 1981.

Since NIOSH found no evidence for radiation-induced deaths at the PNS, we commissioned an investigation into the differences between the original May 1978 report by the Boston hematologist and our subsequent NIOSH work. We found a spurious association created by a measurement bias in the original study which occurred when nuclear workers who had not died of cancer were misclassified as non-nuclear workers based on information supplied by their next of kin. Also, misclassification of occupation in the original study and disagreements about the cause of death accounted for some of the reported excess deaths.

Case Control Analyses. We conducted two case-control studies to further evaluate our overall mortality results epidemiologically for leukemia and lung cancer. We conducted a matched case-control study on 53 leukemia deaths and 212 controls within the previously studied cohort to further ascertain whether there was an association between leukemia deaths and occupational exposure to either ionizing radiation or to organic solvents. We found no statistically significant associations between either ionizing radiation or presumed solvent exposure and either myelogenous or lymphatic leukemia. However, when we examined specific job categories and shops, two occupations, electrician and welder, were associated with leukemia, although this observation could have occurred by chance: the study was not designed to determine whether these two occupations were associated with increased risk.

It should be noted that the study was limited somewhat in its ability to detect an association between radiation and leukemia because cumulative lifetime radiation exposures from employment at PNS were very low. Only six cases had accumulated a lifetime radiation dose of at least 1 rem and only one of them had accumulated a lifetime radiation dose of more than 5 rem. This study is completed and has been submitted for publication. The Navy and the union have already been informed of the results of this study also.

The other matched case-control study involved 405 deaths from malignancies of the trachea, bronchus, or lung and 1,215 controls. Analysis for radiation exposures alone showed a statistically significant excess risk for workers whose cumulative lifetime exposure was at least 1.00 rem. Other known or suspected lung carcinogens at the shipyard included asbestos and welding by-products. Workers with exposure to these substances also showed elevated risk. Therefore, we analyzed for the effects of radiation exposure, while controlling for exposures to asbestos and welding by-products, and found, at all levels of the radiation exposure examined, lower estimates of radiation risk than in the uncontrolled analyses mentioned above. This reduction in risk implies that radiation workers also had a propensity for exposure to asbestos and/or welding by-products. Thus, the elevated risk of lung cancer cannot be attributed totally to radiation exposures, but is more likely due partially to concomitant exposures to asbestos and/or to welding by-products. We anticipate publishing the results of this case-control study soon.

Thank you for the opportunity to provide you with an overview of NIOSH activities regarding our studies of health and safety of workers employed at nuclear facilities. We will be happy to answer any questions.

Senator **Cochran**. We have one other panel before we will adjourn the hearing, but before getting to that panel, we're going to take about a 10- or 15-minute break. We will stand in recess until that time.

[A short recess was taken.]

Senator **Cochran**. If the committee will come to order, we will call our final panel of witnesses to testify. We appreciate the patience of everyone today in getting through the number of panels and witnesses we've had to appear before the committee. We appreciate your patience and your understanding.

The panel consists of Mr. Ben Pfefferle III, who is an attorney representing the Ohio Environmental Protection Agency, and Mr. Robert M. Quillin, who is the radiological health program director of the Ohio Department of Health.

We welcome you to the hearing, and we ask that you proceed. We will call on Mr. Pfefferle first.

STATEMENT OF BEN L. PFEFFERLE III, ATTORNEY, OHIO ENVIRONMENTAL PROTECTION AGENCY, AND ROBERT M. QUILLIN, RADIOLOGICAL HEALTH PROGRAM DIRECTOR, OHIO DEPARTMENT OF HEALTH

Mr. **Pfefferle**. Thank you, Mr. Chairman, Senator Glenn, Congressman Luken, and members of the Governmental Affairs Committee.

My name is Ben L. Pfefferle III, and I am appearing on behalf of the Ohio Environmental Protection Agency and its director, Warren Tyler. On behalf of Director Tyler, I would like to thank the committee for extending an invitation to testify on this most important matter.

I am an attorney for the Ohio Environmental Protection Agency, and I have responsibility for environmental matters relating to hazardous waste regulated under the Resource Conservation and Recovery Act—RCRA—and environmental remedial actions undertaken pursuant to the Comprehensive Environmental Response Compensation and Liability Act, or more commonly known as Superfund or CERCLA. As such, I am intimately aware of the environmental concerns at Department of Energy facilities generally in Ohio, including the Feed Materials Production Center in Fernald.

It is the view of the Ohio EPA that there are no valid reasons to distinguish federally owned or operated facilities from any other facility when one is addressing environmental concerns. Accordingly, the Ohio EPA policy is to require Federal facilities to comply with all environmental laws and regulations.

Toward that end the Ohio EPA has requested the assistance of Attorney General Celebreeze to insure that the Feed Materials Production Center complies with the environmental laws of Ohio.

I would now like to take this opportunity to address the items that were raised by the committee in its invitation to Ohio EPA on April 4, 1985.

The first item that the committee wished addressed was a description of Ohio EPA's responsibilities and program for monitoring and regulating the storage and disposal of hazardous waste at the Feed Materials Production Center, as well as emissions from FMPC of hazardous materials to the air or water.

By way of background, on July 15, 1983, Ohio EPA received authorization from U.S. EPA to administer phase 1 of the Federal hazardous waste program under RCRA. This gives Ohio responsibility for inspections, compliance monitoring, and enforcement at permitted hazardous waste facilities. Ohio EPA is applying for final authorization to administer the Federal hazardous waste program under RCRA from U.S. EPA, which will give Ohio responsibility for issuing all hazardous waste permits. Companies treating, storing, or disposing hazardous waste must currently obtain both State and a Federal permit.

Regulations adopted by Ohio EPA include those governing financial responsibility of owners and operators of hazardous waste facilities, land disposal of hazardous waste, groundwater monitoring and general standards for generators, transporters, and owners and operators of hazardous waste facilities.

Ohio EPA's Division of Solid and Hazardous Waste Management is charged with conducting Ohio's RCRA and CERCLA programs. The division has geologists, scientists, engineers, and other personnel throughout the State, including our southwest district field office, where the feed materials production center is located. These individuals provide onsite inspections of hazardous waste facilities, and technical review for environmental protection and compliance.

The division works in close cooperation with other divisions of Ohio EPA which regulate environmental matters arising under the Clean Air Act and the Clean Water Act.

The division of air pollution control and division of water pollution control have programs for issuing permits for the discharge of pollutants into the air or water. When those discharges include materials regulated under RCRA, the division of solid and hazardous waste management is consulted for assistance and guidance.

With respect to the feed materials production center, it is the position of Ohio EPA that it, like any other manufacturing facility, is required to have the proper environmental permits. In fact, feed materials production center does have an NPDES permit for water discharges. All of the sources requiring permits to install and operate air contaminant sources are undergoing active review by Ohio EPA.

The feed materials production center does not have a hazardous waste facility and operation permit, and it is our position that it is required to have such a permit for the hazardous waste, including mixed hazardous waste, that is treated, stored, or disposed at the facility. Attorney General Celebrezze and his staff have been providing assistance to Ohio EPA on this issue.

Contamination of the groundwater in the vicinity of the feed materials production center has been detected. As a consequence, Ohio EPA is undertaking several immediate steps to ascertain the aerial extent of contamination, both vertically and horizontally, and to determine what remedial steps need to be taken to protect the public health, the welfare, and the environment.

Ohio EPA will require that a remedial investigation and feasibility study under Ohio EPA supervision and direction to be conducted at the feed materials production center. The remedial investigation and feasibility study is a procedure established under superfund for a careful and methodical assessment to determine the scope and quality of any groundwater contamination. This includes identifying the source of the contamination, the extent to which the contamination has spread, both horizontally and vertically, and the steps that need to be taken to correct the prob{em. Ohio EPA is currently discussing the requirements of such a study with officials from the feed materials production center.

The results of the study will be made public when it is completed.

Second, Ohio EPA has retained an independent consultant—a company called GeoTrans—to conduct computer assisted modeling in order to understand groundwater, geological, and geophysical characteristics to help determine the cause and effect of chemical and radiation pollution of the groundwater in the Fernald area. This study is not limited to the feed materials prroduction center, but will address the industrial area in Fernald as a whole.

The second item raised by the committee which it wished Ohio EPA to address is an estimate of the amount of time and nature of resources needed to bring the program at Fernald to the point where pollution levels in air and water have been clearly characterized and quantified.

It is difficult at this time to fully characterize the resources needed by Ohio EPA for this task. However, it is reasonable to expect that, exclusive of efforts by State attorneys, at least 500 man hours of effort by Ohio EPA engineers, environmental scientists, solid waste scientists, geologists and chemists, over a 1-year period will be needed to fully assess the extent of any environmental problems at the facility. Ohio EPA has committed these resources to address the problems at FMPC.

Because of the extraordinary time and expenses being incurred by Ohio EPA, it may be necessary to seek assistance or reimbursement for these extraordinary expenses incurred.

The third item which the committee wished addressed is a quantitative description of pollution standards against which results will be measured.

Dependent upon the medium in which contamination or pollution occurs, such as the soil, air, surface water, or groundwater, different standards, if they are available, will be applied.

Pollution in surface waters is measured against the water quality standards for the stream, river, or lake, affected. Water quality standards are set by regulation by Ohio EPA and establish minimum water quality requirements for the protection of public health and welfare.

Similarly, air emission standards are set by regulation by the Ohio EPA pursuant to the Clean Air Act and EPA requirements. Not all air emissions are regulated under the Clear Air Act. For example, there are not any effective EPA standards for radionuclides. This is a matter now regulated by the Department of Energy, and has been the subject of much discussion today. Ohio EPA currently has no jurisdiction to effectively regulate radionuclides, but it would welcome such authority if the required meaningful legislative changes were made.

Standards to compare any ground water contamination are based on several factors. Contaminated ground water being used as a drinking water source would be measured against the requirements of the Safe Drinking Water Act for the regulated parameters.

With respect to unregulated parameters, or where determined necessary or appropriate by Ohio EPA, general cleanup standards under the national contingency plan promulgated pursuant to CERCLA and corrective actions required under the Hazardous and Solid Waste Amendments of 1984 to RCRA will be employed.

This concludes my formal comments. Thank you for extending an invitation to Ohio EPA to testify today. At this time, I will be pleased to respond to any inquiries from the committee.

Senator **Glenn**. Thank you very much.

We're going to have Mr. Quillin's testimony first, and then we will ask some questions.

Senator Cochran asked me to express his regrets. He had to go run and catch an airplane to go back to Washington, so I will conclude the hearings here.

And, Mr. Quillin, we'll have your testimony now.

Mr. **Quillin**. Thank you, Senator Glenn. I have with me today Deborah Steva, environmental radiation scientist from the Department of Health.

I am Robert M. Quillin, Radiological Health Program director, the Ohio Department of Health.

I would like to express the appreciation of the department for the invitation to testify at this hearing of the Committee on Governmental Affairs.

Before addressing the specific three items we were asked to cover in Senator Glenn's letter of invitation, I would like to review the overall scope of the department's current activities with respect to the feed materials production center.

These activities have been necessarily limited due to the fact that the feed materials production center is a U.S. Government owned/contractor operated facility. What has made the historical situation at the FMPC even more unique has been the security related aspects of its operations and the self-regulatory nature of DOE activities. These conditions have limited the Department of Health proimarily to a response role.

In other words, the department has attempted to be responsibe to issues related to health concerns. In this regard, the department has been supportive of the concerns of workers at FMPC about possible occupational health problems. With respect to this issue, the department has encouraged NIOSH to perform a complete review at FMPC, which we understand is now ongoing.

As concerns the general public outside the FMPC facility, the department is currently in the process of independently sampling, upon citizen request, private ground water supplies in the vicinity of the plant for radioactivity. The sampling is being done by the department in a cooperative agreement with the DOE.

We have received 213 requests for such sampling, and have actually inspected and sampled 81 wells. The results of the analyses will be sent directly to the owner of the well, with the information copy of the results also being sent to DOE.

We are planning to expand this program to other environmental media of citizen concern in the future. Also in the future, the department plans to conduct a health survey assessment of the population at greatest possible exposure in the vicinity of FMPC. This will consist of both a review of health statistics and a health survey. This survey will be conducted by the Department's Division of Epidemiology.

Returning to those three items Senator Glenn asked that we specifically address, I would like to discuss the issue of the Department of Health's responsibilities and program for monitoring and regulating the discharge of hazardous materials into air and water of the Fernald area, particularly from FMPC.

The question of discharges should be separated into two categories: hazardous materials and radioactive materials. This is consistent with the regulatory separation of these two classes of materials on the Federal level. At the Federal level, the U.S. EPA has primary responsibility for hazardous materials. Likewise at the State level, the Ohio EPA has the primary responsibility for hazardous materials. Consequently, I would defer to their expertise in this area.

With respect to radioactive materials, the U.S. Nuclear Regulatory Commission has the lead Federal regulatory role, although other Federal agencies have other roles. While the U.S. NRC has the agreement State program, in which States can assume certain U.S. NRC regulatory functions, this authority does not extend to Federal activities or installations.

As I stated previously, DOE has the unique situation of being a self-regulatory department. Consequently, not only do States lack regulatory authority over discharges of radioactive materials from DOE facilities, it is my understanding that no other Federal agency has had authority over such discharges.

Although States lack regulatory authority over radioactive material discharges from DOE facilities, this does not preclude their performing offsite monitoring of the discharges. However, such radioactive material environmental monitoring requires a definite commitment of resources, which relates to the second item Senator Glenn asked that we discuss.

As a background to this discussion, I would like to mention that the Department of Health is currently conducting radioactive material environmental monitoring in the vicinity of the one operating nuclear power station in Ohio on a cost-sharing basis with the utility concerned and the U.S. Nuclear Regulatory Commission. This has been a very satisfactory arrangement.

We have made estimates of the cost of initiating a similar program around FMPC. Our estimates are that the first year costs would be approximately $250,000, with annual costs of approximately $100,000 thereafter. This program could be in full operation 6 to 12 months after funding is available.

I must comment that one of the paradoxes of environmental monitoring is that typically nothing unusual is found. Consequently, the question quickly arises as to why should funds be spent on testing that show only normal background levels. However, this is precisely what we, in the radiological health profession, want to find since this demonstrates that no problems are present. Also, we want a system in place and operating in case the situation arises that other than normal background levels may occur.

The situation where other than normal background occurs relates to the third issue Senator Glenn asked to be addressed, the question of standards.

This is one of the more difficult issues in the radiological health field, because, on the working level, we are faced with a proliferation of standards, recommendations, guides, et cetera, from a multitude of organizations. Which do you use when there is not a clearcut standard that is applicable?

Here I would like to make a plea for some uniformity and consistency on, at least, the part of the Federal agencies.

While much is known about the effects of ionizing radiation, there still is the appearance of uncertainty because of the range of numbers from which to choose.

Clearly, any standard represents a relative risk decision. For private water supplies, who is to make that decision? In any event, when and if such a standard is developed, it should undergo thorough technical review and public comment, and not be established on an ad hoc basis.

In summary, I would like to express my feeling that there is a need for outside regulatory oversight for every facility possessing radioactive materials, including DOE facilities. While such oversight is not foolproof, it minimizes the possibility of problems which may affect workers at the facility and the public in the vicinity of the facility.

Thank you for the opportunity to testify. I will be happy to try and answer any questions you may have.

Senator GLENN. Thank you, Mr. Quillin.

Will these new EPA standards which Mr. Guimond a little while ago, help straighten out the problem of too many standards, or are they going to add one more to your list?

Mr. QUILLIN. They will add one more to the list. I would hope that all the Federal agencies would come up with a general standard to be used consistently.

Senator GLENN. That's one maybe we should take on. Maybe we need another whole set of hearings in Washington. I'm not one that likes to put hearings on unnecessarily, but maybe that's one we need to take on, because we've run into this as a problem. For instance today we're hearing the DOE standards, the EPA standards, and the State is enforcing EPA standards, thus a little confusion is the result. And I agree with your comment that there are too many standards. I thought perhaps the new EPA standards that are going to be promulgated would help straighten that out, but perhaps not.

What do you know about the contamination of drinking water in the Fernald area at this time?

Mr. QUILLIN. As I say, we have just started our sampling program, Senator Glenn. We don't have many results back yet from our own sampling. I've seen some of the results that the Ohio EPA did, and studies that the U.S. Geological Survey did, and also results that DOE did. It's clear there is some contamination in that area from uranium.

Senator GLENN. Have you made measurements yet on the Crawford farm there? She was here a little while ago. Have you actually made measurements?

Mr. QUILLIN. We have made measurements on the new Knollman well. We have not made measurements on the well that she is referring to.

Senator GLENN. OK. You didn't make measurements on the old well?

Mr. QUILLIN. I don't think we've taken that well. Oh, we have sampled it, but the results are not back yet from our laboratory.

Senator GLENN. OK. Were those taken just recently? This problem is a year or so old. I'm surprised you don't have any measurements on that.

Mr. QUILLIN. Approximately 3 weeks ago, we sampled that well. And the cooperative program with the Department of Energy just started in February, late February, so we have just been sampling for about 1½ months.

Senator GLENN. On page 2 of your testimony, you say that the department of health plans to conduct a health survey assessment of the population at greatest possible exposure in the vicinity of FMPC. Now, we have already asked for the Center for Disease Control which does radiological monitoring also to come up, if we want them to. We haven't formalized that yet, but they indicated a willingness to do so if we wanted them.

Would this duplicate your efforts? Would it be complimentary to your efforts? Would you like to work with them? Would you rather they stayed out? How do you view that?

Mr. QUILLIN. I really cannot comment on that, because that falls within a different area of the health department than I work. I know our division of epidemiology plans to do a survey. I would imagine that they would be cooperative with whatever CDC would plan to do.

Senator GLENN. Well, one of the things I've already asked my staff to do when we get back, as a result of the hearing today, is to stay in contact with the people at the Ohio Department of Health and also get in touch with CDC in Georgia, to see past instances where they have gone into something like this, whether they preferred to work completely on an independent basis, or whether they worked cooperatively, and whether we can do this all together. We're just interested in getting the information, and their people have the equipment, and the people, and the wherewithal to do it, and I would think we could work out a cooperative effort that would be to everyone's benefit.

Mr. Pfefferle, DOE admits that the feed materials production center is not in full compliance with the national pollutant discharge elimination system compliance schedules for installing water pollution equipment to reduce nitrate releases and to provide cold pile run-off treatment. Now Ohio EPA has been notified of schedule problems, and schedule extensions have been requested, can you tell us whether Ohio EPA is going to allow an extended schedule, and are there any fines scheduled for failure to be in compliance?

Mr. **Pfefferle**. Senator Glenn, I do not believe any final determination has been made upon whether the extension will be granted.

With respect to the monetary and penalty issue, that matter, along with the other environmental issues, were referred to the Attorney General's office and appropriate legal action. It is premature, I think, at this moment to discuss or to speculate what fines or penalties will be imposed as no final determination has been made.

Senator **Glenn**. On March 16 a letter was sent to Mr. Robert Spenceley, the plant manager, from Mr. Donald Marshall of the Hazardous Material Management Unit of Ohio EPA, detailing a large number of deficiency in terms of NLO's compliance with the Ohio hazardous waste rules.

Can you tell us what the status of those deficiencies are today as you understand them, and what improvements, if any, have been made over the past year?

Mr. **Pfefferle**. We have met twice now with the Department of Energy and NLO regarding the regulatory issues and the regulatory noncompliance. Those matters are being brought into compliance by the Department of Energy and NLO. They are cooperating with us on that issue.

Senator **Glenn**. What's the present status of the 300 permit applications that have been submitted or will be submitted to the Southwestern Ohio Air Pollution Control Agency by FMPC?

Mr. **Pfefferle**. I understand that they have worked out an agreed upon schedule to submit the applications. I do not have a reason to believe that that schedule is not being met now, Senator.

Senator **Glenn**. All right. When does it start, or how long does it go? It doesn't stretch things indefinitely, does it?

Mr. **Pfefferle**. I do not believe that the schedule stretches out indefinitely, however. I am unable to provide you precise data at this time. I will be happy to provide the committee in writing that information as soon as I am able to obtain it.

Senator **Glenn**. We would appreciate it. Fine.

[The information referred to follows:]

OhioEPA

May 8, 1985

The Honorable John H. Glenn, Jr.
Attn: Valerie Olson
United States Senate
503 Hart Senate Office Building
Washington, D.C. 20510

Re: Management of Health and
Safety at DOE Facilities
April 22, 1985 Testimony

Dear Senator Glenn:

During my testimony on April 22, 1985 before the Committee on Governmental Affairs concerning "Management of Health and Safety at DOE Facilities," I was requested to provide information on the status of Ohio EPA's review of air emission permit applications for the Feed Materials Production Center.

Ohio EPA contracts with the Southwestern Ohio Air Pollution Control Agency ("SWOAPCA") to review permit applications (permits to install and permits to operate) air contaminant sources in the geographic area in which the Feed Materials Production Center is located. It is Ohio EPA's estimate that there are approximately six hundred (600) sources at the Feed Materials Production Center which require air emission permits. As of April 30, 1985, SWOAPCA had received sixty-three (63) applications, eighty (80) more applications were expected the first week of May, and the balance of approximately four hundred fifty seven (457) are due by May 31, 1985.

It is not known at this time whether this ambitious schedule will be met, however officials from the Feed Materials Production Center have represented to SWOAPCA that they would make every effort to meet the deadline. Ohio EPA Division of Air Pollution Control representatives are closely monitoring the progress of the submission of the air emission permit applications and SWOAPCA's review of the same.

I hope that the foregoing is responsive to your inquiry. Should you desire further information, please do not hesitate to contact the undersigned.

Sincerely yours,

Ben L. Pfefferle III

Ben L. Pfefferle, III
Attorney

State of Ohio Environmental Protection Agency
361 E. Broad St., Columbus, Ohio 43216-1049, (614) 466-8565

Senator GLENN. Mr. Quillin, there's one other area I wanted to ask you about. It has nothing to do whatsoever with FMPC. Several years ago I had a series of hearings in Washington on some of the radiation matters, and, at that time, someone came in and testified about what can happen with uncalibrated or miscalibrated x ray machines. And it turned out that there were only a very few States which monitored x ray machines once they were sold and put into dental offices or doctors' offices unless the people chose to have them recalibrated once in a while on their own. It was a big surprise to me at that time, and I just wonder what our status is on that at this time.

How many machines are there in the State of Ohio, and how many inspectors, and how often do they get checked? It has nothing to do with Fernald, but it's something that is a related thing about radiation exposure that came to mind a little while ago.

Mr. QUILLIN. Senator Glenn, we have approximately 8,00 to 9,000 registrants having x ray equipment in the State of Ohio, with about 15,000 to 16,000 x ray machines. We, at the present time, have one inspector for the State of Ohio.

Senator GLENN. For 16,000 machines?

Mr. QUILLIN. Last December, the legislature recognized the problem we had here, and passed legislation, which the Governor signed. We will have a new program going into effect on the first of July. We will be implementing new regulations, a more rigorous schedule of inspections, more staff in this area.

Senator GLENN. And that begins on the first of July then. Do we have a requirement, then, coming up starting in July for the machines to be calibrated every so often? What's the time period on it?

Mr. QUILLIN. We will have a requirement for a routine inspection for the various types of machines, calibration included.

Senator GLENN. But what time period? Do they have to be checked every 2 years, 3 years, 5 years, what?

Mr. QUILLIN. It will depend upon the type of machine. For example, we're projecting for dental units, maybe every 5 years; for a sophisticated medical unit, possibly every year.

Senator GLENN. And, so, we're on top of it starting July 1, anyway, we hope. How many inspectors will there be come July 1, do you know?

Mr. QUILLIN. It will take time to hire the people and train them, of course. We'll be looking at, full time, approximately 6 to 7 people in the State health department, and we will be also contracting local health departments to augment that.

Senator GLENN. We're not going to be overburdened with inspectors even yet, but that's an improvement anyway. I hope we can expand that, because some of the testimony we had about the kind of radiation that people can get from misadjusted or out-of-adjustment machines was rather horrendous. This was several years ago. What we were talking about at that time was setting another national standard. There was a lot of objection to a standard at that time, and, so, we never really got around to doing it, but we're going to set a national requirement that there couldn't be any x ray machine unless it was inspected every so often.

Thank you very much for your comments on that anyway.

We may have some other questions to submit to you gentlemen. I hope you will respond to those questions for the record or to other committee members—sometimes after a committee draft is drawn up, and other committee members, who were not able to make a trip for a field hearing, such as this, have some questions and they or their staffs would like to submit those. We would appreciate a reply so that those can be included also in the committee record.

Our purpose here today is to see if we can shed some light and take some action, more than anything else, to clean up the situation at FMPC. I think, as I said earlier, it's an ideal time, with the DOE now fully alerted to some of the transgressions or deficiencies that have existed there in the past, with Ohio's interest in it, labor's interest in it, new management coming in, community interest in it here, which has certainly been intense, certainly now is an ideal time to start a more cooperative effort for cleaning this up.

I have the personal commitment of the Secretary of Energy from the meeting that I mentioned earlier in my office last Thursday to do exactly that; to see that whatever resources are required will be forthcoming to make certain that this is cleaned up. Some of that, of course, is already underway now.

And we will follow through on all the things we have committed to here today, including the visit out there to the site again.

And we appreciate all of you that have such an intense interest in this here, sticking around today. It hasn't been exactly too cool in the room today, but we appreciate your remaining here, and we appreciate you being witnesses.

The subcommittee will stand in adjournment subject to the call of the chair.

[Whereupon, at 3:20 p.m., the subcommittee was recessed, to reconvene subject to the call of the chair.]

ADDITIONAL MATERIAL SUBMITTED FOR THE RECORD

MIAMI GROUP
Ohio Chapter
Sierra Club

TESTIMONY SUBMITTED

before

The Subcommittee on Energy, Nuclear Proliferation and Government
Processes of the Governmental Affairs
Committee, United States Senate,

Hearings on the Glenn-Wirth Bill,
City Hall, Cincinnati,Ohio,
April 22, 1985

Cay Tuck
Cay Tuck
Conservation Chair-Issues

Bud Hoekstra
Bud Hoekstra
Fernald Task Force

Allen Feibelman
Allen Feibelman
Fernald Task Force

Kevin McGee
Kevin McGee
Fernald Task Force

The Feed Materials Production Center (FMPC) at Fernald, Ohio is also the largest low-level radioactive and mixed waste site in the country; The wastes are uncharacterized and the plant is in violation of twenty-two state and federal hazardous waste and solid waste laws.[1] It is not known what ranking the site would assume on the superfund priorities list, would such a ranking be promulgated. No one knows what threat or risk the site poses to the Great Miami Aquifer, the largest in the Midwest, which lies directly beneath the plant.

The FMPC is the nation's chief emitter of radionuclides.[2] A resident, NIOSH calculates, only a half-mile from the plant stands an increased risk of one in a thousand of cancer. This assessment is based on DOE data taken from NLO instrumentation, which, the Sierra Club believes, is not appropriate technology.

Because of documented uranium releases (3800 pounds of uranium hexaflouride on February 14, 1966, for example) and documented missing uranium (250,000 pounds) Fernald rankd among the top polluters in the country. No risk assessment has been calculated for its annual average accident release rate. A comprehensive epidemiological or health impact study in the community still needs to be commissioned. A Department of Energy pilot study shows a 36% higher digestive cancer rate among workers, whereas digestive cancer is on the wane in the US as a whole.

The FMPC is troubled by the multitude of conflicting standards that is endemic to the nuclear industry. Both the EPA and the DOE regulate radionuclides and radiation wastes. The DOE's standard for uranium in drinking water is 100 to 150 times higher than the proposed standards of the EPA of 6. 8 micrograms uranium/liter of water. In converting picocuries to micrograms, the DOE's conversion factor is half the EPA's. Where DOE and EPA have standards, the DOE's standards for environmental protection favor production. At the FMPC and other facilities, the dual responsibilities of protection and production place the DOE in an untenable conflict of interests.

The FMPC is part of a "mis-education " problem, a gap in radiation knowledge that plagues the facility's neighbors and workers. Although the US Public Health Service lists among its 1990 priority objectives the goal of reducing the number of X-rays in the country by 80 million as a radiation control measure, the management at National Lead of Ohio which runs the FMPC for the DOE still maintains that drinking its uranium in water or breathing its dust is not a significant risk.

The Sierra Club supports the Glenn-Wirth Bill and the Senate Bill #892 which clarifies the solid waste disposal act, and encourages the following additional congressional actions to protect the health of current and future generations of neighbors and workers, and the Great Miami Aquifer, the largest underground source of water in the Midwest:

1) Encourage the Department of Energy to accelerate its characterization of the waste pits and silos at Fernald. If the contents of the pits are as benign as the DOE maintains, then the chemical analysis required for this step can be done within the next four to five months.

The Citizens Advisory Board proposed by Joe LaGrone, director of the DOE weapons program at Oak Ridge, should be kept apprised of results during the testing, and final results should be made public within a week after the tests are completed. Any excessive delays will erode good will and trust towards the DOE by neighbors, workers and the public which the plant is charged to protect.

2) Request the Environmental Protection Agency to rank the waste site at the FMPC on its Superfund list. At present the waste wastes are subject to neither Superfund nor RICRA. Despite this oversight, Superfund ranking would make use of the EPA's sophisticated methodology to assess the risk which the wastes pose to the aquifer. As Joe LaGrone has acknowledged, ultimate disposition of the wastes, which are currently buried in shallow clay and sometimes synthetic rubber lined pits, must lie elsewhere. Since April 10, 1985, all new wastes have been stored in steel lined barrels for shipment to storage facilities elsewhere.

Failing EPA involvement, the Office of Technology Assessment should be requested to assess the results of the DOE characterization and the environmental hazards of the wastes, with special attention to the aquifer. In this case, the scope of the OTA study should include an assessment of the DOE's characterization methodology.

3)Encourage the Department of Energy to send individual, type written letters to any person whose body or property; whether soil, vegetables, water or other, has been tested. The letter should include the substances tested for, the rationale for the sample choice, the results, and a lay explanation of the significance of the results. Sampling without feedback has been a troubling cause of fear and mistrust around the FMPC at Fernald.

4) Encourage theCenter for Disease Control at Atlanta to cooperate with the Ohio Department of Health in an epidemiolocical study of workers at the FMPC and in the surrounding area. Most studies in the past have been carried out by or sponsored by the DOE, which may lead to a conflict of interest. The expertise of the CDC would be a valuable addition to the ODOH's own resources.

5) Building upon the Memorandum of Understanding on Responsibilities for Hazardous and Radioactive Mixed Waste Management - signed February 22, 1984 between the DOE and the EPA, pass legislation to formally subject all such wastes to RICRA. This will remove the DOE from the untenable position of being responsible for both productionand environmental protection, and will increase public confidence that their health is being adequately protected around DOE sites.

6) Hold hearings on permissible exposures to radionuclides. This question, which lies at the center of the entire regulatory debate-"How much is safe?" needs to be debated at the highest legislative levels. Standards should be conservative because many radionuclides are terratogens which may endure for centuries and millenia. EPA's current standards, promulgated in response litigation, are high, and DOE standards, which protect Fernald neighbors, remain higher yet.

ENDNOTES

[1] Testimony of Anthony J. Celebrezze Jr. , Attorney-General of Ohio before the Subcommittee on Energy, Nuclear Proliferation an and Government Processes of the Government Affairs Committe, U. S. Senate; April 22, 1985, pl 3.

[2] Congressman Luken citing an EPA study, during the hearings.